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HANDBOOK

77/6/4722.

OF THE

·303-IN. HOTCHKISS MACHINE GUN.

MARK I. and I*.

April, 1918.

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HINTS FOR INSTRUCTORS.

1. Always inform the squad before beginning the lesson:—

(*a*) The subject for instruction.

(*b*) The object of the lesson.

2. Make sure that every member of the squad fully understands the previous lesson before proceeding to the next.

3. Be brief and keep to the point. Do not dwell on non-essentials.

4. Talk to the squad, not to the gun.

5. Do not shout—talk loud enough for all the squad to hear.

6. Illustrate each point as you explain it. Do not try to explain anything that cannot be seen.

7. Always have the kit ready.

8. Take notes in writing as to the progress made in each subject by each member of the squad.

9. Make yourself acquainted each evening with the next day's work, and prepare your instruction carefully.

10. The success of a squad in mechanical work largely depends on the zeal and ability of the instructor.

11. The method of instruction will be based on the following sequence:—

(*a*) Demonstration.—The instructor should show exactly how a thing takes place in the gun or is done.

(*b*) Explanation.—The instructor gives in a few words a description of what takes place or is done.

(*c*) Imitation.—The gunner under instruction tries to perform what he has just seen the instructor do.

(*d*) Interrogation.—The instructor asks a few questions of those under instruction to see that they fully understand the lesson.

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LIST OF PLATES.

·303-IN. HOTCHKISS MACHINE GUN.*

1.—NOMENCLATURE OF PARTS OF THE GUN.

1. The following is the nomenclature of parts of the gun:—

Barrel.—With gas cylinder; gas regulator; orifice screw; and foresight with cover.

Breech block.—With extractor and spring; and firing pin.

G. **Butt stock.**—With two screws; catch† and tube for elevating screw; and hinged strap with two screws.

Cocking handle.

Feed piece.—With spring.

Fermeture nut.

Guard.—With trigger; sear and spring; and locking screw.

Handguard.—With barrel rest catches and springs.

T. **Pistol grip.**—With screw and bolt with screw washer; and vulcanite side pieces with screw. Mark I* is arranged to take the shoulder piece.

T. **Shoulder piece** (for use with pistol grip only).—With T-headed fixing pin and leather thong.

Piston rod.

* Guns issued to the Tank Corps are generally similar to those issued for ground use. Parts and accessories peculiar to the Tank gun are lettered "T," those peculiar to the ground gun are lettered "G."
† In certain guns these are omitted.
"T" indicates parts of the gun as used by the Tank Corps.

Body.—With locking nut; ejector with spring and cap; cartridge stop with spring and holder; feed piece cover; and backsight with bed, leaf, slide, and slide catches. Mark I* body is arranged for either strip or belt feed. A fixed sight replaces the backsight in guns used by the Tank Corps.

Recoil spring.—

2. The following is the nomenclature of appurtenances of the gun:—

T. **Belt.**—Holding 50 cartridges.

Feed strip.—Holding 30, 14 or 9 cartridges.

Barrel rest.—Bipod with socket and two separator pieces and nut.

T. **Clamp.**—With two side plates; and two nuts and spring washers.

T. **Cradle.**†—With plunger and spring; inner plate with spring catch and stop screw; and pan with axis pin.

T. **Deflector** (Mark I§ and Mark II†).—With latch; and axis pin.

T. **Deflector bag** (Mark I§ and Mark II†).—With frame; band; and spring fastener.

Shackle.—With screw; brass chain with two S-hooks; latch; and spring.

Tripod.—With yoke and spring catches; saddle with fixing screw; pivot and clamping screw; leg bracket with clamping screw; adjustable pillar; and three legs.

§ Special to Mark I. guns. † Special to Mark I* guns.
"T" indicates parts and appurtenances of the gun as used by the Tank Corps.

2.—GENERAL DESCRIPTION (Plates I. to V.).

3. Weight of gun with butt and stock, about 27 lbs.

Weight of feed-strip (30 rounds), empty, about 4½ ozs.

Weight of feed-strip with 30 rounds, about 1 lb. 15 ozs.

Weight of belt empty, 6¾ ozs.

Weight of belt filled, 3 lbs. 3½ ozs.

4. The gun may be considered to be divided into two portions, stationary and moving. It is worked automatically by two forces:—(1) The pressure of the gas resulting from the explosion of the charge; (2) the recoil spring. The gun is air-cooled.

Stationary Portion.

5. The stationary portion consists of the barrel (1), with gas cylinder (2), handguard (3), body (4), locking-nut (5), guard (6), trigger mechanism (7), cocking handle (71), and wooden butt (8).

6. The **barrel** (1) is very thick, and at the breech end is provided with radiating rings (9).* At the muzzle end is a ring (10) which carries the **foresight block** (11), and underneath, a stud (12) to which the barrel rest is attached. The **foresight** (13) is of barleycorn pattern, and is surrounded by a protecting hood. About its middle the **gas vent** (14) is drilled in the bottom of the barrel, and at this

* In certain barrels two of these rings are omitted.

point the barrel is encircled by a **ring** (15) which is extended downwards to encircle the **gas cylinder** (2), the vent being carried through the ring and the extension. In advance of this is a second support for the gas cylinder. At the breech end, in rear of the radiating rings, are the **trunnions** (16) to which the tripod is attached. In rear of the trunnions are the arrangements for attaching the barrel to the body. These consist of a **key** (17) formed on the under side of the barrel which enters a slot in the forward end of the body, thus positioning the barrel; a double set of **interrupted flanges** (18), which correspond with similar flanges in the locking-nut; and a **stud,** under the left trunnion, which prevents the barrel entering too far into the body. The rear end of the barrel has recesses for the extractor claw, and for the projections on the face of the breech block.

7. The **gas cylinder** (2) consists of a tube into which the gas vent (14) leads. It has a scale engraved on it by means of which the **regulator** (19) can be set at any desired point, and a shallow channel is cut lengthwise in it at the forward end. Immediately in prolongation of the gas vent a hole is drilled through the cylinder for manufacturing purposes. This hole is closed by an orifice screw (20) with a square head. The regulator, which closes the front end of the cylinder, consists of a cap which is provided with a square nut and with a milled surface, so that the regulator can be adjusted either by hand or with the wrench provided. The cap is prolonged to fit over the gas cylinder and has two longitudinal saw cuts, the piece between the cuts being sprung inwards and provided with a nib which engages in the channel

in the gas cylinder and holds the regulator in position. Through the cap passes a stem which is threaded at the end near the cap to screw into the gas cylinder, which is threaded internally at its front end. The rear end of the stem is provided with three rings which fit the cylinder closely. Thus, by screwing the regulator in or out the size of the chamber in the cylinder is diminished or increased, and the pressure raised or lowered, as may be required for the working of the gun. In the rear end of the gas cylinder is a passage (21) through which the gases pass on to the head of the piston.

8. The **handguard** (3) is a casing of sheet steel, which at its rear end fits into slots on the body, and is kept in position by the support of the gas cylinder (2). It encloses the rear portion of the gas cylinder and the forward part of the piston rod. At its front end it has a number of holes which allow the gases after actuating the piston to exhaust into the air. To it are rivetted the **catches** and **springs** which retain the legs of the barrel rest when the latter is not in use.*

9. The **body** (4) is of steel, rectangular in shape in its lower portion and cylindrical in its upper. At the front end the cylindrical portion is threaded externally (22) to take the **locking-nut** (5), and a slot is cut underneath for the key (17) on the barrel. Further to the rear this slot is enlarged to allow of the movement of the boss on the fermeture nut. Externally, in rear of the thread, is a small **lug** (23) with serrations which engage with the serrations on the **spring** (24) of the locking-nut. On the rect-

* In certain guns these are omitted.

angular part are the two slots (25) in which the rear end of the handguard (3) engages. On the top of the body are the feed channel and the support for the feed mechanism. The former consists of **guides, front** (26) and **rear** (27), through the lower portion of which the cartridges travel, while grooves are cut in the upper portion to guide the strip. The body of the Mark I* gun has deeper slots in the feed guides than the Mark I gun, to allow of the passage of a belt which, owing to its hinges, is thicker than the feed strip. This body is inscribed "Belt or Strip feed" on the front end. The Mark I gun cannot be used with a belt. The Mark I* is suitable for both belts and strips. Between the guides a wedge-shaped **tongue** projects from the left side of the body, its function being to force each cartridge slightly out of the clips on the strip of this tongue is drilled the recess for the **cartridge stop** (28) and spring. The latter consists of a small plunger, surrounded by a spiral spring, in a cylindrical casing which screws into the base of the wedge-shaped tongue. Immediately in rear of the base of the tongue is a recess (29) which allows the rear clips of the strip to pass. On the top of the front guide is the undercut recess (31) which takes the tongue of the feed mechanism spring. On the top of the rear guide is the **support** (30) for the feed piece, with a recess which holds the lever when in its lowest position; stops which limit its travel when in its highest position; and a circular bearing for the stem, cut away at the rear to allow of the removal of the stem. Between the two guides, on the left, is fixed the **backsight bed** (32). The

backsight is of radial form, with a V. It is adjusted by means of a **slide** with spring catches.

For guns for use by the Tank Corps a **fixed sight** is provided. This consists of an arm the forward end of which takes the place of the backsight bed, which is removed, and is secured by the backsight bed fixing screw, while the rearward extension carries a tube the front end of which is bevelled to allow the feed piece to be removed and which forms the sight. The sight gives the elevation for 600 yards. The foresight can be used in conjunction with it, but if the foresight is shot away the tube alone still enables a sufficiently accurate aim to be taken.

Underneath the rear guide on the right side is the seating for the **ejector,** which is a small plunger which, with its spring, is retained in the body by a screw cap and projects into its interior. Below this is the **casing** (33) which encloses the two arms of the feed piece, a hole in the lower part of which forms a bearing for the stem and allows its lower portion to pass through the casing. The casing is closed by a hinged **cover** which has a flat spring to keep it closed and a **stud** (34) to facilitate opening. Underneath are two **hooks** (35) which take the trunnions at the front end of the guard.

The body is cut away at the top between the two feed guides; on the left side, at the same point (36) to allow of the ejection of the empty case; at the right side to allow of the movement of the two arms of the feed piece; and underneath and at the rear end for the attachment of the guard. Internally, the body has, between the two feed guides, a **shoulder** against which the rear end of the fermeture

nut seats, and which prevents any backward movement of the nut. Immediately in rear of this are the grooves and plates (37) which guide and support the breech block, the plates being reduced in size in rear of the ejection opening. Underneath the rear feed guide the top of the body has an internal **cam groove** which controls the rotation of the firing pin. The right side of this groove is continued to the rear end of the breech casing in the shape of a **ridge** (38) which keeps the upper boss on the firing pin (65) in the recess (86) in the breech block (64) during that part of its travel. At its rear end are the recesses into which the projections on the side of the guard engage, and the left side is drilled to take the **screw** (43) which locks the rear end of the guard. The rear face has portions of a **circular groove** (39) which form a path for the projection on the disc (107) of the cocking handle (71).

10. The **locking-nut** (5) screws on to the front end of the body. It has at its front end a **stud** which acts as a stop by coming in contact with the handguard (3), and at its rear end a **spring arm** (24), the under part of which is serrated to engage with the serrations (23) on the top of the body. These two parts are in such a position that when the serrations are engaged the barrel is securely locked to the body, while, when the stud is in contact with the handguard (3), the nut is in such a position that the barrel can be withdrawn. Internally the nut has **interrupted flanges** which engage with the flanges (18) on the rear end of the barrel. In its front end are recesses (40) which enable a wrench to be used for removing the barrel.

11. The **guard** (6) contains the trigger mechanism (7) and closes the rear end and under side of the body, to which it is attached by means of **trunnions** (41) at the front end and **side lugs** (42) at the rear end. It is kept in position by a **locking screw** (43). It has a **socket** (44) and **tangs** (45) for the attachment of the butt stock. On the upper part of its rear face a **line** (46) is engraved which, in conjunction with the lines engraved on the disc (107) enable the cocking handle (71) to be set to safety or to give various natures of fire. It is bored to allow of the entry of the cocking handle, and in the recess (47) thus formed is a **collar,** kept in position by two fixing pins in such a way that between it and the rear of the guard is a space in which the tenons (110) on the cocking handle work. The collar has two **nibs** which project inwards and engage the grooves (112), (113) on the cocking handle, while its rear face has several **recesses** with which the nibs (111) on the tenons of the cocking handle engage and retain the handle in one of its several positions. The forward portion of the recess serves to contain the rear end of the recoil spring (70), which therefore bears against the collar and keeps it forced backwards. It, however, allows the collar to be pushed forward as the nibs (111) on the tenons of the cocking handle pass over the ridge between two adjacent recesses on the rear face of the nib, and makes it spring backwards as the recess is reached. The cocking handle is thus prevented from rotating unless force is applied to the lever. Underneath the recess is a **rectangular hole,** which allows the tail (52) of the trigger bar to pass through the guard. The

under part of the guard is slotted to allow the trigger (48) to pass through it into the finger opening. Above this slot is a horizontal **channel** in which the trigger bar works, with a projecting **stop** to limit the forward travel of the bar. In front of that is the **well** in which the sear is housed, bearings (49) for the sear axis being provided at the front end, the left bearing being cut away to allow of the removal of the sear. In front of that bearing is the **arm** (50) which acts as a stop for the sear arm.

12. At right-angles to the finger-piece of the **trigger** (48) is the **trigger bar** (51), which has a wedge-shaped **tail** (52). At the front end of the bar is a **recess** (53) across which a pin is fixed to which the **spiral spring** is attached. At the left side of the front end of the bar is a **T-shaped arm** (54) which is curved outwards to clear the piston rod. The front extremity of the cross bar of this arm is furnished with a **hook** (55), which engages with the top of the arm of the sear and communicates the movement of the trigger to the latter.

The **sear** consists of a rotatable **axis pin** (56) carrying a **block** (57) which engages with a recess (83) in the bottom of the piston rod, holding the latter back and thus performing the function of the nose of the sear in the rifle; an **upright arm** (58) near the left end of the axis, which is engaged by the hook of the T-shaped arm; a **downwardly-projecting arm** (59), to which the other end of the spiral spring is attached; and, at the left extremity of the axis, a **milled head** (60) which, in case of a failure of the mechanism, or for the purpose of stripping and assembling, allows the sear to be rotated and the piston rod

to be released. Between the block and the arm is a **flat** on the axis which allows the sear to be removed from the guard, the block being cut away at this point for the same purpose.

13. The **cocking handle** (71) consists of the **lever** (105) and **knob** (106), **disc** (107), and **stem** (108). The lever springs backwards from the disc and is then bent at right-angles. The disc has, on its periphery, close to the lever, a **projection** (108[a]) which prevents the handle being turned over too far to the left; **three lines,** marked respectively "A," "R" and "S"*; and **recesses** (109) diametrically opposite to the first two of these lines. The setting of the disc (107) so that one of these lines corresponds with the line (46) engraved on the rear face of the guard, results in the recess below it controlling the backward movement of the tail (52) of the trigger bar. On its inner surface a **groove** is cut leaving a **ridge** which works in the grooves (39) on the rear face of the body and keeps the travel circular. On the stem near the disc are two **tenons** (110) which work in the space between the rear face of the guard and the collar which it contains. On the front of these tenons are **nibs** (111) which engage with the recesses in the rear face of the collar and prevent the cocking handle from rotating from the position in which it is set. In front of the tenons six longitudinal **grooves** are cut in the stem. Of these, two are for lightness. The others are arranged in two pairs, the right-hand one of each pair (112) being open at the rear end and closed at the front, the left-hand

* A—"automatique," or continuous fire. R.—"répétition," or single-shot fire. S.—"sûreté," or safety.

one (113) closed at the rear end and open at the front. The wall between the two grooves at the rear end is cut away (114) to allow of communication between them. It is in these grooves that the inwardly projecting nibs of the collar in the guard lie. In front of this part the stem is reduced in diameter and is cylindrical. At the extreme end are two **lugs** (115) which enter the recesses (74) in the collar in the piston rod, and, when the cocking handle is rotated after entry, provide a means by which the piston rod can be drawn back.

14. The wooden **butt stock** (8) is provided with a hinged steel **strap** (61), and is drilled (62) and provided with a brass tube to take an elevating device. The latter consists of two externally-threaded rods joined by an internally-threaded collar, the upper rod passing into the hole in the butt and the lower being fitted with a foot which rests on the ground. Rotation of the collar then raises or lowers the butt as may be required. The elevating screw is retained in the butt by means of a sliding **catch** with a spring (62[a]). In the absence of the elevating device the hole in the butt is utilised to accommodate an **oil bottle.** This is of steel, with a flange at its lower end, while the mouth is threaded to take a screw collar which secures the bottle in the butt. In the bottom of the bottle is a screw-driver slot by means of which it can be prevented from rotating while the collar is being screwed down or removed. The oil bottle is closed by a milled head, to which a brush is attached. A leather pocket and **strap** are provided on the right of the butt to carry the dismounting wrench.

As an alternative, for use in confined spaces, a **pistol grip** is provided. It is of gunmetal and fits into the socket at the rear end of the guard, being secured to the tang. On either side are vulcanite **side pieces,** secured by a screw. A hole is drilled in the rear face to take the stud on the shoulder piece, and another hole is drilled crosswise to take the fixing pin of the shoulder piece (Mark I* only).

The **shoulder piece,** which is an adjunct to the pistol grip for use in the open, has at its front end a **fork,** between the arms of which is the **stud** which helps to keep it in position when attached to the pistol grip. A T-headed **fixing pin,** threaded at its outer end and attached to the shoulder piece by a leather thong, is provided for securing the shoulder piece to the pistol grip. The fixing pin is inserted from the left side, so that its head is not in the way of the firer's right hand. The fork is attached to a **steel tube,** at the rear end of which is an upstanding **steel plate.**

The butt-stock and pistol grip are both suitable for use with either mark of gun.

Moving Portion.

15. The moving portion consists of the piston rod (63); breech block (64), firing pin (65), and extractor (66); fermeture nut (67); feed piece (68) and spring (60); and recoil spring (70).

16. The **piston rod** (63) is a heavy steel rod. Its front end forms a **cup** (72) which surrounds the rear end of the gas cylinder (2) when the rod is in its forward position. It is bored internally from the

rear, the hole being of sufficient diameter to take the front part of the recoil spring. About the centre of its length a **collar** (73) is screwed into the hole in the rod. This collar has two **recesses** (74) cut in it to allow the lugs (115) at the front end of the stem of the cocking handle to pass it, while its rear face acts as a seating for the front end of the recoil spring.

Externally it has on its upper surface **guides** (75) which work along the bottom of the plates (37) in the body which support the breech block (64), while its lower surface is flat and is extended sideways (76), the whole travelling on the bottom of the body and on the under portion of the guard. The **shoulder** (77) formed by the front of the right extension is utilised to keep the piston rod in its rearmost position, and the breech open, when the last cartridge of a clip has been fired. The holding back of the piston rod is accomplished by the shoulder just mentioned being prevented from going forward by its engagement with the lower arm (98) of the feed piece (68) when the latter is in its lowest position. The left extension is cut away at the rear end to clear the T-headed arm (54) of the trigger bar (51).

On the top of the piston rod is a **cam groove** (78) which rotates the fermeture nut (67), the front face of the cam as it moves back unlocking the breech, and the rear face of the cam as it moves forward locking it. Behind this are **blocks** (79), (80) which enter the under part of the breech block (64) and between which the lower boss (89) on the firing pin (65) then lies. On the right side of the piston rod are two **cam surfaces** (81), (82) one above the other, the slopes being opposed. These surfaces act on the

two arms of the feed piece. Underneath the rod towards the rear end is a **recess** (83) into which the block (57) of the sear rises and holds back the rod.

17. The **breech block** (64) is cylindrical, a flat surface with **flanges** (84) being formed underneath its rear half to work in the guide grooves (37) and support it. In the left flange is a **shoulder** which allows the breech block to be pushed forward by means of the dismounting wrench when, owing to a failure in the action of the firing pin in the recess of the breech block, the latter is jammed. A **slot** (85) is cut through the breech block towards the rear end, the slot being enlarged (86) on the top of the breech block to allow the upper boss (90) of the firing pin (65) to be turned over to the left. At the rear end of the slot is an inclined plane, which enables the firing pin to be removed. The blocks (79), (80), on the piston rod enter through the slot in the breech block. The rear face has a circular hole in it, and, forward of the slot, the breech block is drilled cylindrically. Externally it has towards its forward end the three parts of the **interrupted screw** (87) which engage with similar parts in the fermeture nut (67). On the left side is the **recess** for the extractor (66) and its spring (66a) and on the right the **groove** which allows the breech block to pass the ejector. On the front face is the firing pin hole, while the bolt head carries the **hood** (88) which holds the extractor in place and two **projections** which enter recesses in the rear face of the barrel.

18. The **firing pin** (65) is cylindrical and has underneath it a **boss** (89) which lies between the two

blocks on the piston rod when the gun is assembled, and, above, another **boss** (90) with sloping faces which work in the cam groove on the top of the interior of the body. The lower boss is sloped at the rear end to permit of the removal of the firing pin from the breech block.

19. The **extractor** (66) has a hook which engages the rim of the cartridge and a stem surrounded by a **spiral spring** (66a) which forces the hook inwards when it has passed over the rim.

20. The **fermeture nut** (67) is a steel sleeve which carries internally an **interrupted screw thread** (91) corresponding with that on the breech block. Its forward portion (92) is cylindrical and fits over the rear portion of the barrel, which therefore prevents any forward movement of the nut, while its backward movement is made impossible by the shoulder in the body. The nut has two longitudinal **slots** cut in it, of which the upper, when in the unlocked position, allows the cartridge to pass from the strip to the chamber, and the lower corresponds with the ejection opening in the body. The latter slot is recessed internally to allow the hood of the extractor to pass. The smaller of the two portions between the slots has a **depression** (93) in it which, in the locked position, allows the front clips of the strip to pass. Underneath the nut is a **boss** (94) with two sloping faces. The boss is operated by the cam groove (78) in the upper surface of the piston rod (63), causing the nut to rotate.

21. The **feed piece** consists of a **stem** (68) which rotates in bearings in the rear feed guide (27) and in

the feed piece casing (33). The stem has at its upper end a small undercut **stud** (95) which engages with the opening (102) in the spring (69). Below this is the **lever** (96), whose head is so shaped as to engage the central openings in the strip while it is sloped so as to ride over the ridges between the openings when the lever is moved over to the right. Below this the stem has two flats on it to allow of its removal from its upper bearing. Towards the bottom are the two **arms** (97), (98) which are actuated by the cams on the right side of the piston rod and produce an oscillating movement of the stem and lever. The bottom (99) of the stem is roughened to provide a grip for the finger in pressing the stem upwards.

The **spring** (69) is shaped from a flat steel plate. At its front end a **tongue** (100) is formed which fits into the undercut recess (31) on the front feed guide, with a **stud** (101) which assists removal. At its rear end on the right is a hole (102) which fits over the undercut stud (95) on the stem, in front of which is a **stud** (103) against which the front of the undercut stud bears. In the rear of the hole the spring is prolonged and curved downwards to form a means of removal. On the left the spring is curved downwards and provided with a **tooth** (104) which engages with the rear openings in the strip and prevents any movement of the strip to the right while the lever is being moved in that direction. The tooth has a sloping face so as to slide over the ridges between the openings when the strip is moved to the left. Underneath the spring and just in front of the hole (102) is a smaller stud which is so shaped that, when the

feed piece is raised to its highest position, it forces the lever over to the left.

The **No. 2 feed piece spring** has a deeper tooth than the No. 1 spring to compensate for the greater depth of the slots in the Mark I* body. It is marked "No. 2." The No. 1 spring bears no mark. The No. 2 spring can be used in either mark of body, whether for belt or strip feed. The No. 1 spring can only be used in the Mark I body and therefore not with a belt.

22. The **recoil spring** (70) is a spiral spring which lies in the interior of the piston rod (63). Its front end bears against the collar (73) in the piston rod and its rear end against the recess (47) in the guard.

23. The gun is fed by means of a flat steel **strip** (116) of the ordinary Hotchkiss type. Three rows of clips are formed on it, by stamping out and pressing up, to hold the cartridges. On the rear edge of the strip a number of small raised nibs equal to the number of cartridges are provided to position the cartridge. In later patterns a continuous ridge is substituted for these. On the right-hand end of the strip is an **extension** which enables the feed piece to eject the strip when the last cartridge has been fired.

An alternative method of feed is by means of a flexible metallic belt. The **belt** consists of a number of units, provided with clips to hold the cartridges identical with those on the strip, joined by hinges. The early pattern is constructed of seventeen units, the first sixteen units holding three cartridges each and the last unit two cartridges only. The later pattern has sixteen units, the first unit holding six and the ~~the trigger bar to pass through the guard.~~ The

last unit two cartridges. The extra length in the first unit increases the ease of insertion into the feed guides. In both types the last unit has the front and rear clips either set back, removed or not formed in order to prevent this clip retaining a cartridge. The centre clip is formed as usual to enable the feed piece to eject the belt when the last cartridge has been fired.

The belt can be used only when the cradle is attached to the gun to contain the loaded portion.

24. The 30-round strips are carried in a wooden **box,** strengthened by steel strips at the angles, with internal partitions dividing it into five compartments, each of which holds two strips. The top of the box is a hinged lid with a spring catch. A leather handle is provided for carrying the box.

The 9-round strips are carried in bandoliers.

Special arrangements are provided for the 14-round strips.

The ammunition box for use in Tanks is made of tin, fits securely into the racks provided in a Tank, and is divided into six compartments each to hold a belt.

The ammunition box is provided with a leather handle at one end and a quick release catch at the other end.

The boxes should be placed into the racks with the handles outwards to facilitate withdrawal.

The belts, which hold 50 rounds, may be filled either by belt-filling machine or by hand, but care must be taken to leave the last space of the belt empty, in order that the gun may eject the belt when empty.

Each belt must be rolled up closely, with the cartridges on the outside, starting with the 2-round unit and finishing with the 6-round unit.

A belt is then placed in each compartment of the box with the 6-round unit towards the handles, the bullets pointing downwards.

The belts fit the compartments closely, so as to prevent them shaking loose.

When a belt is required for loading the gun, the box is withdrawn from the rack and placed on the floor of the Tank directly under the gun, the handle of the box being to the left of the firer with the lid removed.

A belt is then extracted by inserting the thumb of the right hand into the centre of the rolled belt, and the four fingers of the right hand against the 6-round unit, when the belt may be lifted out of its compartment and will be in position in the hand ready to be inserted directly into the feed guides, with the rolled portion laid in the cradle.

25. The **clamp** is provided to enable the cradle and deflector to be attached to the gun. It consists of two **plates.** The left plate has on its outer face the **bracket** for the axis pin of the deflector and on its inner face two **bolts,** threaded at their outer end. The right plate has two holes for the bolts and an **arm** to take the socket of the cradle, with a recess into which the spring plunger of the cradle enters. Two nuts and spring washers retain the right plate in position and connect the clamp to the gun. Both plates have on their inner faces **ledges** which rest on corresponding ledges on the body, and, when in position on the gun, their front ends must butt

against the projections on the body which retain the handguard.

26. The **cradle** has a **socket** which passes over the arm of the clamp, with a spring plunger which keeps it in position. To the socket is attached the **inner plate** which is slotted to allow the belt to pass into the feed guides. It has flanges which support the edges of the pan, while on its rear face is a **spring catch** to hold the pan in position and a stop screw to prevent the spring being overstrained. The **pan** is shaped to contain the coiled belt and is hinged at the bottom to the inner plate. On its rear face is a square hole into which the tooth of the spring catch enters.

27. The **deflector,** Mark II, is arranged to cover the ejection opening in the gun. Its outer face is curved so as to deflect the empty cases downwards, and in its ends are slots for the attachment of the bag. It is riveted to an **arm** which is hinged between brackets on the left side plate of the clamp. In the brackets are slots for the engagement of the **latch.** The latter consists of the handle and the head. The head is cut away at two points so that when the handle is vertical it clears the brackets and the deflector can be turned down away from the ejection opening in order to clear a stoppage, replace a broken extractor or spring, or oil the mechanism. When, however, the handle is pulled over so as to lie at an angle of 45° towards the firer the head of the latch engages with the slots in the brackets and holds the deflector against the ejection opening. The upper part of the head forms a spring arm which retains the latch in the open or closed position as may be required.

28. The **deflector bag** is of canvas and will contain 300 empty cases. The mouth of the bag is fastened by eyelets to an internal **frame,** to the ends of which are riveted **lugs** to enter the slots in the ends of the deflector and attach the bag to the deflector. Lower down the bag a steel **band** is fixed inside it by means of similar eyelets. This band ensures that the upper part of the bag is kept open, thus securing a free passage for the cases. The bottom of the bag is formed by a **flap,** held in position by a **spring fastener.** The bag can thus at any time be emptied without removing it from the deflector.

The clamp, deflector, and deflector bag can be used with either mark of gun.

29. The **barrel rest** consists of a socket, which attaches to the stud (12) underneath the muzzle of the barrel. To this are hinged two legs, between which are two separator pieces. The latter serve to keep the legs extended when the rest is in use and to keep them closed when it is folded up. In the latter position the lower ends of the legs are retained by catches which are riveted to the handguard. The legs are provided near their lower ends with plates which prevent the rest from sinking into soft ground.

30. The **tripod** consists of an aluminium yoke, grooved on either side to take the barrel trunnions and fitted with spring catches to retain them. The lower end of the yoke is pivoted in a saddle, being fixed by a screw with a vice pin. The under side of the saddle is jointed to the upper end of a pivot giving horizontal traverse and is fixed by a clamping screw. The lower end of the pivot enters the vertical pillar which passes

through the leg bracket. The pillar can be fixed at any desired height by means of a clamping screw. The legs are hinged in the leg bracket, their lower ends being pointed and provided with feet to seat on the ground. The legs are pressed outwards automatically by means of a movable collar actuated by a spring secured above the legs by a nut.

When not in use the lower part of the tripod hinges forward to lie underneath the gun, the legs being secured by a shackle. The latter consists of a band which passes round the gas cylinder between the ring and the cylinder support and is secured by means of a screw. A brass chain is attached to it, which passes round the legs and holds them, the free end being retained by a spring latch on the band. (Plates VI., VII. and VIII.)

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3. STRIPPING AND ASSEMBLING.

31. **To strip the gun.**—If the clamp is attached to the gun, remove it. See that the breech is closed. If it is not, raise the feed-piece stem by pressing up its lower end till a click is heard, showing that the piston rod has been disengaged from the lower arm of the feed piece and has gone forward till it is held by the block of the sear. Then press the trigger, having first set the disc of the cocking handle to "A" or "R."

Turn the lever of the cocking handle upwards till it will go no further. It is then slightly to the left of the vertical, and the tenons correspond with the

tenon recesses in the rear opening of the guard. Draw back the cocking handle till the tenons are clear, then turn it to the right so that it is at an angle of 45 degrees with the vertical. This brings the open grooves on the stem opposite the nibs of the collar in the guard and the lugs on the stem in line with the recesses in the collar in the piston rod. The cocking handle can then be withdrawn.

Unscrew the guard locking screw three turns, and, pressing the butt forward and then downwards, disengage the projections on the sides of the guard from their recesses in the body and the trunnions from their hooks. Remove the butt and guard. Lift the T-headed arm of the firing mechanism till it is clear of the sear arm, then revolve the milled head till the sear axis can be lifted out. Pushing the trigger bar backwards to its full extent, lift the front end to get the trigger clear of its slot, and remove the firing mechanism. Separate the two portions by removing the spiral spring.

Take out the recoil spring.

Insert the cocking handle in the piston, with its handle at an angle of 45 degrees to the right of the vertical, so that the lugs enter the recesses in the collar in the piston rod. Turn the lever vertical and draw the handle and the piston rod with the breech block out of the body. **No force must be used in removing these parts.** Lift the breech block off the piston rod. Turn the upper boss of the firing pin out of the recess, and draw the firing pin backwards out of the breech block, raising its rear end while so doing. Insert the hook of the hand extractor or a small drift or screwdriver between the two rear coils

of the extractor spring and compress the spring. When the base of the spring is clear of its recess, the extractor and spring may be drawn outwards and removed from the breech block. Push the feed-piece spring slightly forward to disengage it from the undercut stud on the stem, then lifting the finger piece, draw it backwards till the tongue is clear of the undercut recess on the front feed guide. **Care must be taken not to lift the spring more than is necessary, to avoid straining or breaking it.** Open the feed-piece cover and raise the backsight to a vertical position. Lift the stem and revolve it to the rear till the flat is opposite the opening in the upper bearing. Remove the stem. Using the ejector key, unscrew the ejector cap and remove the ejector and its spring. Turn the locking nut to the right as far as the stop will permit by means of the wrench. Draw the barrel out to the front. Unscrew the regulator and remove it. Turn the locking nut slightly to the left to disengage its stud from the handguard and remove the latter. Unscrew the locking nut and remove it, and take out the fermeture nut from the body. Unscrew the cartridge stop and remove plunger, spring and holder.

32. **To change the barrel.** With the dismounting wrench turn the locking nut as far as it will go and draw the barrel out of the body. If the barrel is too hot to handle, one man should firmly hold the barrel rest while the other draws the body and guard to the rear. The spare barrel is then inserted and the locking nut turned back into the locked position. A hot barrel, after removal from the gun can be handled by passing the slot in the centre of

the dismounting wrench over the stud underneath the muzzle for the barrel rest.

33. **To remove the extractor without stripping the gun.**—Remove the strip from the gun. If the deflector is attached to the gun turn the handle of the latch into the vertical position and allow the deflector to fall clear of the ejection opening. Take an empty case and place it in the front end of the ejection opening. Pressing the trigger and controlling the moving parts by means of the cocking handle, allow them to go forward slowly till they are stopped by the case. The extractor and spring will then be accessible through the ejection opening, and can be removed in the ordinary way.

34. **To assemble the gun.**—In assembling the parts are replaced in inverse order to that detailed for stripping. Before replacing the piston rod and breech block, the fermeture nut must, if necessary, be rotated by hand to the unlocked position, when its slot corresponds with the ejection opening in the body, and the upper boss of the firing pin must be placed in the recess in the breech block in order to allow it to lead into the body. After inserting the piston rod and pushing it partly forward, it will be checked by the shoulder on its right coming against the lower arm of the feed-piece. The stem of the latter must be pushed upwards to allow the piston rod to pass and go fully forward. **No force must be used in replacing the piston.** If when replacing the guard difficulty is experienced in keeping the rear end of the recoil spring in position, an inch or so of the stem of the cocking handle should be inserted through the hole in the rear face of the guard in such a manner

as to secure the rear end of the spring. The cocking handle should lie diagonally downwards on the right of the butt stock and be grasped, as well as the butt stock, with the right hand.

4.—ACTION OF MECHANISM.

35. **To fill the strip or belt.**—Force the cartridges between the clips till the rear face of the base of each cartridge rests against the front face of the small raised nib or the continuous rib on the rear edge of the strip or belt.

(*For description of the machine for filling strips and belts, see para.* 64.)

36. **To prepare the gun for firing.**—Turn the lever of the cocking handle upwards and to the left as far as it will go. The nibs on the collar in the guard are then opposite the closed grooves on the cocking handle, while the lugs on the head of the latter are engaged in front of the collar in the piston rod.

Pull the cocking handle back sharply to its full extent. The stops at the ends of the grooves coming against the nibs on the collar in the guard prevent its being pulled out of the gun. The cocking handle draws back with it the piston rod. The early part of the backward movement of the piston rod causes the fermeture nut to revolve and free the breech block. At the same time the small block on the piston rod withdraws the firing pin. When the firing pin is

fully withdrawn, the large block on the piston rod carries back the breech block and during this motion the cam groove inside the body turns the firing pin over to the left so that its upper boss lies in the recess in the breech block. The bottom of the piston rod now begins to depress the block of the sear and the lower cam surface on the right side of the piston rod working against the lower arm of the feed piece begins to turn the lever to the left. Finally the block on the sear rises into the recess in the bottom of the piston rod and, very shortly afterwards, the shoulder on the front of the extension on the lower right side of the rod comes behind the point of the lower arm of the feed piece. The stem of the feed piece is then forced down by the pressure of its spring, the lever falling into the recess in the bearing in the upper feed guide and the lower arm lying in front of the shoulder on the piston rod. The piston rod is by the latter action prevented from going forward under the impulse of the recoil spring, which has been gradually compressed during the backward movement of the piston rod.

Push the cocking handle forward, still keeping the lever slightly to the left of the vertical, and, when it is fully home, turn the lever till one of the engraved lines is opposite the line on the guard, according to the nature of the fire desired. By pressing on the bottom of the feed-piece stem raise it. The lower arm is thus disengaged from the shoulder on the piston rod, which is forced slightly forward under the influence of the recoil spring till it is held up by the engagement of the block of the sear with the recess in the bottom of the piston rod. From the right

insert a filled strip, cartridges downwards and bullets to the front. When using a belt disengage the spring catch of the cradle and allow the pan to fall away. Holding the coiled belt in the right hand pass the first unit through the slot in the inner plate into the feed guides, close up the pan till the spring catch engages, and drop the coiled belt into the cradle.

The descriptions and instructions which follow apply equally to the belt and the strip.

Pushing the strip home, the lever of the feed piece is lifted slightly by its front end, and afterwards falls, under the influence of the spring, into engagement with the first of the central line of holes in the back of the strip. The tooth on the left rear portion of the feed-piece spring is also lifted by the insertion of the strip, and then springs downwards into engagement with the first of the rear line of holes in the back of the strip. When the strip is properly in position the wedge-shaped tongue will have passed between the strip and the first cartridge, pressing the latter slightly away from the strip, while the cartridge will be forced against the cartridge stop and will have pushed the plunger to the left so that it protrudes about ½-inch from its housing, or about twice as much as in the rest position. This protrusion is an indication that the strip is fully inserted, and that the gun is ready to fire.

37. **To remove the strip and close the breech.**—The strip can be removed by pressing on the bottom of the feed-piece stem, raising it as far as possible, and withdrawing the strip to the right. This is only possible when the piston rod is in its backward position. The trigger must then be pressed and the piston rod allowed to fly forward.

The belt can be removed in the same manner, the pan being opened if necessary.

If it is required to close the breech before a strip has been inserted, it is necessary first to raise the stem of the feed piece so that the lower arm is disengaged from the shoulder on the piston rod. The latter then moves forward till it is held by the sear, and pressure on the trigger will allow it to fly forward.

Effect of the Return Spring and of the Ignition of the Charge.

38. The behaviour of the trigger mechanism is controlled by the position of the disc on the cocking handle. When the disc is set to "S" it prevents the backward movement of the trigger bar and the gun cannot be fired. When set to "R" the smaller of the two recesses in the disc is opposite the tail of the trigger bar. As the latter is pulled back by pressure on the trigger, the hook on the front of the T-headed arm draws with it the arm of the sear. This causes rotation of the sear axis, and a consequent depression of the block of the sear which releases the piston rod. During this motion, the sear spring is put in tension, both by the pulling back of the trigger bar and by the rotation of the sear axis. As soon as the trigger bar has come back far enough to release the piston rod, the ramp on its tail causes the disc to depress it, with the result that the hook of the T-head is lifted and released from the arm of the sear. The latter flies forward under the influence of the spring and the block of the sear therefore rises ready to

intercept the piston rod when it returns after firing the cartridge. The gun cannot again be fired till the trigger is released and the T-head allowed to go forward into engagement with the arm of the sear. In this position of the disc, therefore, it is impossible, provided the mechanism is in working order, to fire more than one shot for each pressure of the trigger. When the disc is set to "A" its larger recess lies opposite the trigger bar. The latter, therefore, is not depressed as it passes the disc, the T-head is not disconnected from the sear arm, the block of the sear is held permanently depressed, and the piston rod is not retained at the end of its backward travel. It therefore flies forward again, and continuous fire is obtained so long as pressure is kept on the trigger. With this exception, the action of the mechanism is identical, whether continuous or single shot firing is used, and is as follows:—

39. The gun having been prepared for firing as already described, a cartridge, partly forced out of the strip by the tongue, is opposite the chamber, and the strip is held so that it cannot move by the tooth of the feed-piece spring and by the head of the feed-piece lever. The piston rod is held back by the block of the sear, having been allowed to come forward into engagement with it owing to the lifting of the feed-piece stem during the insertion of the strip, which disengages the lower arm of the feed piece from the shoulder on the right of the piston rod. The upper boss on the firing pin is held into the recess in the breech block by the rib on the upper part of the body, and the larger block on the piston rod is in contact with the lower boss on the firing pin. The recoil

spring is in compression. The disc of the cocking handle must then be set to "A" or "R," according to the nature of the fire required.

40. On the trigger being pressed the block of the sear is rotated till it is clear of the recess in the bottom of the piston rod. The recoil spring then asserts itself and drives the piston violently forward. During the early part of the forward motion the face of the breech block comes into contact with the lower part of the base of the first cartridge in the strip and begins to force it clear of the clips and into the chamber. When it is about half way into the chamber the upper cam on the right of the piston rod begins to turn the feed lever over to the right. The two motions go on simultaneously till the cartridge is fully in the chamber, and the feed lever, having ridden over the back of the strip, has been forced by its spring into the second of the central line of holes in the strip. The groove in the top of the body now rotates the firing pin so that its upper boss is clear of the recess and in line with the long slot in the breech block. As this motion finishes, the cam groove on the top of the piston rod working against the boss on the fermeture nut rotates the latter till it locks the breech block securely to the barrel. While the rotation is going on, the firing pin is being carried forward by the pressure of the large block of the piston rod on its base, and, at the moment that the locking rotation is completed, it is carried against the cap and ignites the cartridge.

After the bullet has passed the gas vent, a portion of the gases rushes violently into the gas cylinder and finds its way out by the passage in its rear end.

The piston rod is thus given a sharp blow and is forced backwards. The action on recoil is the same as that described in the preparation of the gun for firing, except that the cocking handle does not move; that an empty case is extracted and ejected; that the feed lever in its movement over to the left carries with it the strip, and thus places a fresh cartridge in position; and that, the strip holding it up, the feed-piece stem does not drop at the end of the backward travel of the piston rod. The piston rod is thus either free to go forward again at once and fire another cartridge, or is held back by the rising of the block of the sear, according to the position in which the disc of the cocking handle has been set.

When the last cartridge of a strip has been fired, the motion of the feed lever to the left ejects the empty strip, the head of the lever acting on the extension at the right hand end of it. The piston rod also is held back as, there being no strip in the gun, the stem of the feed piece is forced downwards by its spring and its lower arm engages the shoulder on the right of the piston rod. To continue firing, it is necessary to force the stem upwards and insert another strip.

Safety Device.

41. As already explained, the rotation of the cocking handle till the letter "S" corresponds with the line on the rear face of the guard puts the gun at safety. When, however, fire is stopped before a strip is fully expended, and if it is necessary for any person to go in front of the muzzle, it is advisable, in addition to putting the cocking handle in the "S" position,

to withdraw the strip partially to the right after pressing up the stem of the feed piece. Accidental closing of the breech then introduces no danger, as no cartridge remains opposite the chamber.

The turning of the cocking handle to the "R" or "A" position, and, if it has been withdrawn, pushing the strip over to the left as far as it will go, again puts the gun into firing condition.

Unloading.

42. When fire ceases, the moving parts are normally in the backward position. If a partially expended strip is in the gun it must be removed by pressing the stem of the feed piece up and withdrawing the strip to the right. The trigger must then be pressed to release the recoil spring and close the breech. If, however, the moving parts are in the forward position when fire ceases, it indicates either that there has been a miss-fire or that the gas produced by the ignition of the charge has not had sufficient power to give full recoil. In either case the cocking handle must, after an interval, be pulled sharply back (*see* para. 45 (e)). In the event of a miss-fire, this will result in a live round being extracted and ejected, while in the other event, a case will be ejected unless the previous recoil was sufficient to carry back the moving parts far enough to produce ejection, though not far enough to allow the sear to engage. If a partially expended strip is in the gun it must be removed in the ordinary way. If a live round is not ejected, the cleaning rod must then be passed down the barrel to see that a bullet is not remaining in the bore. Finally the

trigger must be pressed to release the recoil spring and close the breech.

43. **To remove the cartridges from the strip.**—Hook the forefinger under the bullet, and, pressing the thumb on the strip, force the cartridge out of the clips.

5.—POINTS TO BE ATTENDED TO IN PREPARING THE GUN FOR ACTION.

44.—(*a*) Examine the gun to see that no part is deficient.

(*b*) Remove the oil and examine the bore to see there is no obstruction in it. See that the regulator is set to the proper graduation. Remove oil as far as possible from the exterior of the barrel to prevent the giving off of fumes when the barrel gets hot. These precautions should be taken with all available barrels as well as with that in the gun.

(*c*) Oil all moving parts. A moderate amount of oil, G.S., lubricating is sufficient for this. As the essential parts are sufficiently accessible through the ejection opening and by opening the feed-piece cover, there is no need to strip the gun.

(*d*) Test the action of the ejector and cartridge stop. They should work freely and without stiffness.

(*e*) See that the clamp, cradle and deflector, if they are to be used, are securely attached.

(*f*) ~~(e)~~ Test the action of the gun several times by pulling back the cocking handle and pressing the trigger.

(*k*) ~~(g)~~ Before filling, examine each strip to see that the clips are not distorted or cracked.

(*l*) ~~(h)~~ See that the strips are carefully filled, the cartridges being pushed home till their rims lie in front of the nibs or rib on the strip.

(*m*) ~~(i)~~ See that all spare parts and tools are in the spare parts bag or box.

(*n*) ~~(j)~~ See that the oil can and, where it is provided, the oil bottle in the butt, is full of oil.

(*o*) ~~(k)~~ See that all cases and bags are properly secured, to avoid loss or damage in transit.

6.—POINTS TO BE ATTENDED TO DURING FIRING.

45.—(*a*) Keep the strips in their boxes till they are required, and replace empty strips in the box as soon as possible. Take care to avoid damaging them and to prevent their carrying dirt into the mechanism or chamber. Re-fill empty strips without delay.

(*b*) Manipulate the gas regulator as may be required to maintain the desired rate of fire. It can, as a rule, be opened out as the gun gets hot. If, when the cocking handle is set to "R," the gun fires more than one round for each pressure of the trigger, screw the gas regulator home to increase the pressure of the powder gas, and so secure that the piston rod is forced back sufficiently far for the sear to engage.

(*c*) Release the trigger at the end of each strip, as otherwise the lifting of the feed piece to insert the next strip will cause the breech to close.

(*d*) During a temporary cessation of fire set the cocking handle to "S." If a partially expended strip is in the feed guides, it should be slightly withdrawn to avoid danger from an accidental closing of the

breech. The moving parts should be lubricated if necessary during a cessation.

(*e*) If a miss-fire occurs, allow a short interval to elapse before drawing back the cocking handle to eject the defective round. If the gun is very hot, the interval should be as much as one minute, as the heat of the barrel may be sufficient to ignite the cartridge within that time.

(*f*) The barrel may be cooled by cold water. The water may be applied externally by means of a sponge or cloth or the barrel may be dipped in it. In the latter case, the water must be removed from the barrel and gas cylinder before firing is resumed, either by the use of flannelette or by firing one or two cartridges.

7.—POINTS TO BE ATTENDED TO AFTER FIRING.

46.—(*a*) See that the gun is unloaded.

(*b*) See that the bore and chamber, also the cup of the piston rod and the nozzle of the gas cylinder, are well oiled directly firing has finished.

(*c*) See that the recoil spring is eased.

(*d*) See that any live cartridges which may be among the fired cases are collected.

(*e*) See that the gun is thoroughly cleaned without delay at the first available opportunity. All parts of the mechanism, as well as the strips, must be examined at the same time.

(*f*) See that damaged parts which have been replaced during firing from the spare parts box are sent to the armourer for repair or replaced from store.

8.—INSTRUCTIONS FOR CLEANING.

47. When ball ammunition has been fired, daily cleaning of the barrel, gas cylinder, gas regulator and cup of the piston is necessary for at least ten days afterwards. Subsequent cleaning must depend on the discretion of the officer in charge of the gun; in a dry climate once a week should be sufficient, but in situations where the gun is exposed to a moist atmosphere it may be necessary daily.

After cleaning, all parts must be left lightly coated with oil.

48. Oil, mineral, burning (paraffin), is a convenient means of loosening and removing rust, but, if left in contact with steel, it assists the formation of rust. After use, therefore, it must be carefully removed and the part oiled with oil, G.S., lubricating, which, in addition to being a lubricant, is also a preservative. The use of emery or other cutting or gritty substance is strictly forbidden.

49. **To clean the barrel.**—If it is necessary to clean the barrel when in the gun, the cleaning rod must be used, at first with the wire brush to loosen the fouling, then with successive pieces of flannelette, about 4 inches by 1½ inch in size, the first one oily and the remainder dry, till the bore is rag-clean. Finally a slightly smaller oily piece of flannelette will be passed through the bore unless the gun is to be fired immediately.

Great care must be exercised in using the cleaning rod to avoid breaking it at the joints. When inserting it it must be supported by one hand close to the point of entry to the barrel, flannelette of a size which will not enter the bore reasonably easily must

not be used, and the push and pull of the rod must be in a line with the axis of the bore.

A damaged cleaning rod must not be used, on account of its liability to scratch and cut the bore.

The normal method of cleaning will be by use of the double pull-through and flannelette. For this, the barrel will always be removed from the gun.

One of the double pull-throughs provided should have a piece of wire gauze, attached as laid down in Musketry Regulations, while the other should be used for dry flannelette only. Having carefully oiled the gauze, drop the weight of the pull-through through the bore. The barrel should then be fixed in a vice or held by a man while one man works either end of the pull-through. Unless rust or metallic fouling are present in the bore, the gauze should not be pulled backwards and forwards more than three times, to avoid wearing out the barrel. The gauzed pull-through should then be laid aside, and the other one used with dry flannelette till the bore is rag-clean. In doing this, the flannelette must be pulled out of the bore each time. To reverse the direction of the pull while the flannelette is in the bore will lead to its becoming jammed. Finally, a slightly smaller oily piece of flannelette should be placed in the loop of the gauzed pull-through and passed once through the bore to leave it slightly oiled. If the gun is to be fired immediately, this operation should be omitted, and the bore should be left dry.

The utmost care must be taken to avoid allowing the cord to rub against either muzzle or breech. If this precaution is not insisted upon, a groove will be worn by the cord, which, if at the chamber end, will

tend to cause burst cartridge cases, and, if at the muzzle end, will destroy the accuracy of the barrel.

Whatever the method of cleaning adopted, the greatest care must be taken to see that the chamber is thoroughly cleaned, all dried oil and dirt being removed from it.

Fouling can most easily be removed before it has had time to set and become hard. The barrel should therefore be cleaned as soon as possible after firing.

50. **To clean the gas cylinder and regulator.**—After removing the gas regulator, clean the cylinder with the cleaning brush which is provided. If hard fouling is present it should be removed with the gas cylinder cleaner, the brush being afterwards used to remove the fouling. The interior of the cylinder should be left dry.

Fouling should be removed from the stem and head of the gas regulator with a piece of oily flannelette. After cleaning, the stem should be left lightly oiled, but all oil should be removed from the head.

51. **To clean the cup of the piston.**—Remove fouling with an oily piece of flannelette, leaving the cup slightly oiled unless the gun is to be fired immediately.

52. **To clean the mechanism.**—The moving parts must be removed, but it will not always be necessary to strip the trigger mechanism, extractor, ejector or cartridge stop.

All parts must be thoroughly cleaned with a mixture of equal parts of oil, G.S., lubricating and oil mineral burning. They must afterwards be dried and lightly oiled with oil, G.S., lubricating, before they are replaced.

Dirt must be carefully removed from all parts of the stationary portion, particular attention being paid to recesses which are likely to harbour dirt.

Dried oil can be removed by the use of turpentine.

After the parts have been replaced, the exterior of all metal portions should be rubbed over with a piece of flannelette, lightly oiled with oil, G.S., lubricating.

53. **To clean the strip.**—Rust should be removed and the strip lightly coated with oil, G.S., lubricating as a preservative. No more oil than is absolutely necessary must be used, as any excess will be carried into the chamber by the cartridges, where it will dry and obstruct the entry of the cartridge.

54. **Sandy and dusty countries.**—When working in sandy and dusty countries great care must be taken to avoid grit getting into the moving parts and on the strips. This applies more when the gun is being fired than when resting, as in the latter case it is easy to cover the gun. When firing, arrangements should be made to avoid the disturbance of dust, caused by action of the moving portions and gases escaping from the handguard.

The following notes will assist in overcoming this difficulty:—

(1) Guns not in use should be kept covered.
(2) When cleaning, use lightly oiled rag if the gun is not actually in use. The oil can will always be at hand if required.
(3) Damp the ground, or lay a ground sheet or greatcoat under and around the gun position.

(4) Gun to be cleaned free from grit at every available opportunity.
(5) Strips to be kept in boxes until required. Should one become fouled with grit, put aside until unloaded and cleaned.
(6) Keep the breech closed until it is necessary to load.

55. **Protection against gas.**—Measures should be taken by means of blankets soaked in anti-gas solution, to protect ammunition and gun recesses.

The gun must be kept carefully cleaned and well oiled with a mineral oil.

Occasional short burst of fire will lessen the chance of guns jamming from the action of gas during a gas attack.

The effects of corrosion on ammunition are even more serious than the direct effects of gas upon the guns. Strips of ammunition should therefore be kept in their boxes with the joints made gastight by inserting strips of flannelette.

After gas attack.—Guns should be cleaned and re-oiled at once. Oil cleaning will only prevent corrosion for about 12 hours or more. At the first available opportunity the gun must be stripped and working parts cleaned with boiling water containing a little soda.

Ammunition and strips carefully examined; any rounds affected by gas replaced, then cleaned and used as soon as pssible.

9.—EXAMINATION AND REPAIRS.

56. The following are the principal points to which attention must be paid in examining the gun. Except as regards replacement of damaged parts from the parts provided as spare, repairs cannot, as a rule, be carried out by detachments, and those detailed below, as well as the tests to be made by means of gauges, will be undertaken only by a qualified armourer.

Barrel.—See to the condition of bore, rifling, lead and chamber; that the foresight is not damaged or displaced; that the stud for the muzzle rest, the stop for the locking nut, the interrupted flanges, the key and the projections on the rear face of the barrel are not damaged; that the gas cylinder nozzle is clear; and that the gas regulator works sufficiently freely to be moved by hand, though not so freely that it will jar round during transport.

Body.—See that it is not deformed in any part; that the thread for the locking nut is not damaged; that there is no obstruction in the grooves of the feed-guides; that the feed mechanism, the cartridge stop and the ejector function correctly; that the guide groove for the firing pin in the rear portion is clear and in good condition; that the locking screw is in good order; that the backsight and slide are not damaged; and that the handguard fits correctly.

Locking nut.—See that it functions correctly and is properly held by the serrations on the spring arm.

Fermeture nut. See that it is not burred or cracked, and that its thread and boss are not damaged.

Piston rod.—See that the working surfaces and the cam slot are smooth and not burred; that the piston head is not cracked; and that the face of the recess on the underside with which the sear engages has not been tampered with.

NOTE.—No attempt must be made to lighten the pull-off by altering the shape of the rear face of the recess or of the sear. If this is done, the sear will fail to retain the moving parts when the stem of the feed-piece is pressed up to release them and the gun will commence to fire before the trigger is pressed.

Breech block.—See that all the surfaces are smooth and not burred; that the interrupted thread is in good condition; that the front shoulder of the recess on the left for the firing pin is not cracked or broken; that the hole in the face for the point of the firing pin is clear; and that the extractor is in good order.

The armourer should occasionally test the distance of the face from the end of the chamber with ·064 in. and ·074 in. gauges. In order to do this, the cocking handle, guard with butt stock, recoil spring, firing pin, extractor, feed-piece spring, feed-piece and handguard must be removed. The removal of the firing pin and extractor necessitates the removal of the piston and breech block, both of which must be subsequently replaced. The removal of the handguard also necessitates the removal of the barrel. The forward end of the piston can now be controlled with one hand whilst the thumb of the other hand is applied to the rear end of the breech block to push it forward, thereby ensuring a light control on to the

gauge. The breech block should close over the ·064 gauge, but not over the ·074 in. gauge. In the latter case, the fermeture nut should not turn into its complete locking position; if it does, either the breech block or the fermeture nut is defective, and one or other component should be replaced by a new one till a satisfactory combination is obtained.

Firing pin.—See that the point is not damaged and that the upper and lower bosses are in good condition, and their surfaces smooth.

Recoil spring.—See that it is not cracked or broken.

Cocking handle.—See that the stem is not bent or cracked; that the lugs and lever are in good condition; and that the recesses in the disc are not deformed.

Guard.—See that the trigger mechanism is in good condition and works correctly; that the rear face of the sear has not been tampered with; that the collar against which the recoil spring bears is correct; that the butt is not split or broken; and that the hinged strap is in good condition. If the oil bottle is fitted it should be seen that it is firmly fixed in the butt. If it cannot be tightened up by means of the screw collar a washer of leather or other suitable material should be inserted under the flange at the bottom.

57. Where burrs or roughnesses on working surfaces are found during examination, the parts should be taken to an armourer who will smooth them down with fine emery cloth.

Strip and belt.—See that the clips are not cracked and, if necessary, use the resizing tool to restore their shape. See that the hinges of the belt are flexible.

Clamp.—See that the bolts are not bent; and that the plates seat securely on the body.

Cradle.—See that the spring plunger engages properly with the recess in the clamp arm; that the inner plate and pan are not bent or distorted; and that the spring catch holds the pan securely.

Deflector.—See that the frame fits closely against the ejection opening; that it is not damaged in such a way as to prevent the free passage of the cases; and that the latch acts properly.

Deflector bag.—See that the lugs attach it securely to the deflector frame; that the band is not bent; and that the spring fastener holds the flap securely.

Shoulder piece.—See that the arms of the fork are not bent inwards; and that the fixing pin is in good condition and securely attached.

10.—STOPPAGES.

58. Stoppages with the gun can usually be overcome by a high standard of training and knowledge of the gun by the team. They are generally due to neglect on the part of the team when carrying out the points before, during, and after firing.

During training, particular stress should be laid on the following points:—

(1) Judicious use of oil.

(2.) Setting of the gas regulator making allowance for climatic and service conditions. The gas regulator should be adjusted to ensure having only the quantity of gas required to ensure correct functioning of the gun.

(3) Examination of gun, ammunition, and strips.

(4) Correct loading.

(5) Ascertaining the position of the breech block and fermeture nut when pulling back the cocking handle by noting when the key on the latter engages the collar in the piston. (This requires a very high standard of training, and is not possible with all men.)

(6) Sharp, clean action in pulling back the cocking handle.

59. Paragraph 60 gives a table of probable stoppages:—

Col. I gives the immediate action.
Col. II, the probable cause of the stoppage.
Col. III, probable position of the breech block.
Col. IV, remedy.

When teaching stoppages the instructor should "set them up," taking care not to put any unnecessary strain on the gun when doing so.

(I) The range and target will always be indicated to the firer.

Immediate Action.	Secondary Action.	What Found.	What to do.	Probable Cause.
Butt from shoulder, cock gun, No. 2 pushes strip home, relay, fire.		i. Breech block in any position.		i. Bad introduction of strip.
		ii. Breech block home.		ii Missfire, Hard extraction, Space in strip.
		iii. Breech block back from chamber.		iii. Bulged or damaged round.
	A. If stoppage occurs frequently, cock gun, put cocking handle to "S," screw up gas regulator ½ to 1 divn., relay, fire.	A. Breech block in any position.		A. i. Lack of gas. ii. Excessive friction.

Immediate Action.	Secondary Action.	What Found.	What to do.	Probable Cause.
	B. If, on pressing trigger, gun does not fire, NOTE POSITION of breech block.	B. i. Breech-block forward and locked.	B. i. Unload, ensure barrel is home, tighten up locking nut, reload, relay, fire.	B. i. Locking nut loose.
		ii. Breech-block forward but not locked.	ii. Unload, strip gun, and investigate, reload, relay, fire.	ii. Filings or loose caps in fermeture nut or cam groove of piston.
		iii. Breech open with live round bearing down on empty case.	iii. Cock gun, apply "S," clear obstruction, screw up gas regulator ½ to 1, division, relay, fire. Clean thoroughly at first opportunity.	iii. Lack of gas or excessive friction.
		iv. A live round partly fallen down from strip.	iv. Cock gun, apply "S," remove round, change strip, relay, fire.	iv. Defective strip.

ADDITIONAL NOTES ON STOPPAGES.

61. If, when rectifying a stoppage during firing, it is found necessary to screw up the gas regulator, it should be returned to its normal position after the gun has been cleaned, should the fault have been found to be due to excessive friction.

(*a*) **Locking nut.**—If the locking nut has not been screwed home when assembling the gun, the face of the breech block will not fit close against the round in the chamber, and this will cause a succession of missfires. Strip the gun and re-assemble locking nut.

(*b*) **Too much oil in the mechanism.**—This will form a "cushion" and will not allow the recoiling portions to go forward with sufficient force to fire the round. Strip and remove surplus oil.

(*c*) **Burred cams.**—If the gun is allowed to race (too much gas) the cams will become burred and prevent the smooth working of the gun. The remedy to be left to the Armourer.

(*d*) **Broken or damaged firing pin.**—Will cause missfires. Strip and replace.

(*e*) **Weak or broken recoil spring.**—If weak will not carry the recoiling portions forward with sufficient force to fire the round. Replace.

If broken, the gun may continue to fire. Replace. If no spare recoil spring is available, turn the ends in, placing the broken parts to take the seatings.

(*f*) **Hard extraction.**—Will sometimes arise from excess of oil in the chamber or on the strip. Thoroughly clean the chamber.

(*g*) **Lack of gas.**—If it is found necessary to screw up the gas regulator abnormally, it may be due to the vent becoming fouled. This should be cleared by the Armourer, or by removing the gas regulator and firing one or two rounds.

(*h*) **Separated cases.**—Separated cases are exceptional. Should a number of separations occur the gun should be tested by the Armourer for clearance between breech block and the end of the chamber, as in para. 56.

(*i*) **Broken extractor or spring.**—Will leave an empty case in the chamber, live round in the ejection opening. Remove strip, clear obstruction from ejection opening and chamber. Change the extractor or spring.

(*j*) **Broken ejector or spring.**—Will leave an empty case in the ejection opening, the live round being prevented from entering the chamber. Remedy, cock the gun, put cocking handle to "S," remove obstruction, unload, strip the gun, replace ejector or spring.

(*k*) **Failure of breech block to close.**—Using the dismounting wrench applied to the shoulder on the left flange of the breech block push the breech block forward into the closed position. Under no circumstances must the piston rod be hammered back to clear this stoppage.

SETTING UP STOPPAGES.

62. During range work it is not advisable to set up a stoppage for "Lack of gas," as the gun is likely to become damaged.

A demonstration should be given pointing out the necessity for having the regulator in its correct position. Students should always set the regulator correctly.

Live rounds that have been cleared through the ejection opening should be carefully examined for bulges, telescoped bullets, &c.

When setting up a stoppage which results in the breech block being forward, the instructor should ease the recoiling portions to their position by holding on to the cocking handle, checking the action of the recoil spring.

To Cause.	In Barracks.	On the Range.
Bad introduction when loading.	Load, pull the strip to the right slightly.	—
Miss-fire ... } Space in strip ... }	Load and press the trigger	Place a dummy cartridge in the strip.
Locking nut worked loose.	Unscrew locking nut, slightly load and press the trigger.	—
Dirt or filings in fermeture nut or cam groove of piston.	Load, press the trigger, pull cocking handle back till fermeture nut is disengaged from breech block.	—

To Cause.	In Barracks.	On the Range.
Badly filled strip	Place 6 rounds in a strip, pull the 6th round out about ½ inch, load and press the trigger.	Pull a round about ½ inch out of the strip.
Bulged or damaged round.	Place bulged round in the strip, load and press the trigger.	Place a bulged round in the strip.
Faulty ejection due to defective ammun., lack of gas or friction and damaged ejector.	Cock the gun, place an empty case in the ejection opening either lengthwise or crosswise. Pull back the cocking handle, press the trigger, at the same time easing the recoiling portions forward. Push cocking handle home.	
Defective strip ...	Ease the base or nose of a dummy cartridge from the strip. Press the trigger, at the same time allowing the recoiling portions to go gently forward. The nose of the cartridge will catch either at the top or bottom of the fermeture nut.	Use a defective strip.
Broken firing pin. Weak or broken recoil spring.	As for misfire, when the firer presses the trigger after a misfire, instructor tells him that the gun does not fire.	Place two dummy cartridges in succession in a strip.

11.—SPARE PARTS BOX AND BAG.

The box is of the same dimensions as that for the strips. It is provided on its wider side with a hinged lid secured by a spring catch. Fittings are provided to take the whole of the spare parts and tools. The box has a leather handle for carrying purposes.

The bag is a satchel with a shoulder strap. In the absence of the box the spare parts and tools can be carried in it, and when the box also is provided it can be used to contain emergency parts.

Weight of box, empty ... ... 6½ lbs.
Weight of box, filled ... ... 12¼ lbs.

12.—MACHINE FOR FILLING STRIPS AND BELTS *

The machine will fill strips or belts of any length. It consists of four main parts, *viz.*, the bed with its mechanism, hopper, clamp, and handle. The parts are detachable from one another for packing purposes.

The action of the machine is on the same principle as that of the belt-filling machine for the Maxim and

* Machines of early pattern were suitable for filling strips only, the channels in the bed plate not being of sufficient depth to take the hinges of the belt. Any machine which is not shown by the name-plate to be suitable for both strips and belts is to be used for filling strips only.

Vickers guns. The strip slides into the bed at right-angles to the cartridge plunger and is traversed step by step by means of the traversing slide and its pawl. The action slide runs in the bed and is driven by the connecting rod. A cam slot is cut in it which actuates the traversing slide, and the cartridge plunger is attached to it. The strip is kept down by an overhanging bracket while the cartridges are being driven into the clips. The hopper stands up vertically from the bed and the clamp, which extends vertically downwards, engages in a slot in the under side of the bed. The end of the clamp screw is arranged to take the driving handle of the machine.

A box is provided into which the machine packs.

Weight of machine	15¼ lbs.
Weight of machine in box	24 lbs.

To use the machine, the hopper is filled with cartridges and the strip is inserted in the bed till the pawl engages behind the first clip of the centre row. The driving handle is then rotated, and the supply of cartridges in the hopper replenished till the strip is full. Care must be taken that every space in the strip is filled. If it is required to draw the strip back in order to fill a space which has been missed, the trigger underneath the bed must be pressed to release the pawl of the traversing slide.

13.—TOOL FOR RESIZING STRIPS.

The resizing tool is provided to enable the curvature of the centre row of clips on the strip to be restored when through use or damage the clips do not properly retain the cartridges. It must not be used for resizing belts.

It consists of a rectangular body of steel, slotted to allow the strip to pass through it, two shallow channels being cut in the bottom to clear the strengthening ribs on the back of the strip. A projecting handle is provided at either end. The top of the gap is closed by a plate carrying a roller. The plate is attached to the body of the tool by two screws and by means of them and of four set screws passing through the body from its under side it can be adjusted for height.

The top plate and roller having been adjusted to the proper height, the strip is drawn through the body in the reverse way to that in which it passes through the gun, *i.e.*, with extension piece leading, the tool meanwhile being held by the handles. The roller makes contact with the upper part of each clip as the strip is drawn through and forces it down, thus restoring its original shape.

13A

14.—RANGE TABLE FOR MARK VII. CARTRIDGE.

Muzzle velocity with Mark VII ammunition	2,440 f.s.
Weight of bullet	174 grains.
,, ,, cordite charge ...	about 38 ,,

Range in yards.	Angle of Elevation.		Range in yards.	Angle of Elevation.	
	Degrees.	Minutes.		Degrees.	Minutes.
100	—	4·0	1,100	1	4·5
200	—	6·0	1,200	1	16·5
300	—	8·5	1,300	1	30·0
400	—	12·0	1,400	1	45·0
500	—	16·5	1,500	2	2·0
600	—	22·0	1,600	2	21·0
700	—	28·5	1,700	2	42·5
800	—	36·0	1,800	3	6·5
900	—	44·5	1,900	3	33·5
1,000	—	54·0	2,000	4	3·5

The graduations on the sight of the Hotchkiss Machine Gun, which are designed for Mk. VII. ·303-in. ammunition, can be used for Mk. VI. ammunition by adding 250 yards to the range for ranges up to 1,000 yards and by adding 300 yards for ranges over that distance.

15.—SPARE PARTS AND TOOLS.

The following spare parts and tools are issued with each gun:—

Barrel	1
Box, tin, small parts, M.G. ...	1
Brush, cleaning (for gas cylinder) ...	1
Brushes, wire ...	2
Can, oil, Vickers, Lewis and Hotchkiss guns	1
Cleaner, gas cylinder	1
Cover, sight, fore	1
Ejector	1
Extractor	1
Extractor, hand	3
Gauze, wire, pieces	4
Hammer, M.G.	1
Key, ejector	1
Pin, firing	2
Pull-through, double	2
Punch, No. 3, M.G.	1
Reflector, mirror, M.G., ·303-inch	1
Rod, cleaning bore (with brass connection slotted for flannelette) ...	1
Screw-driver, large, M.G.	1
Screw, locking	2
Spring, cartridge stop	1
,, ejector	1
,, extractor	2
,, feed	2
,, recoil	1
,, sear	2
Tool, resizing, feed strips	1
Wrench, dismounting	3

16.—KEY TO THE PLATES (I. to V.).

1. Barrel.
2. Gas Cylinder.
3. Handguard.
4. Body.
5. Locking Nut.
6. Guard.
7. Trigger Mechanism.
8. Butt Stock.
9. Radiating Rings.
10. Ring of Barrel.
11. Foresight Block.
12. Stud for Barrel Rest.
13. Foresight.
14. Gas Vent.
15. Gas Cylinder Ring.
16. Trunnions.
17. Key on Barrel.
18. Interrupted flanges on Barrel.
19. Gas Regulator.
20. Orifice Screw.
21. Exit Passage of Gas Cylinder.
22. Thread on Body.
23. Serrated Lug on Receiver.
24. Serrated Spring of Locking Nut.
25. Slots for Handguard.
26. Front Feed Guide.
27. Rear Feed Guide.
28. Cartridge Stop.
29. Recess for Clips of Strip.
30. Feed Piece Support.
31. Recess for Feed Spring.
32. Backsight Bed.
33. Feed Piece Casing.
34. Stud on Feed Cover.
35. Hooks for Guard.
36. Ejection Opening.
37. Breech Block Guides.
38. Firing Pin Guide.
39. Groove on Rear Face of Body.
40. Recesses in Locking Nut.
41. Trunnions of Guard.
42. Side Lugs of Guard.
43. Locking Screw.
44. Socket of Guard.
45. Tangs of Guard.
46. Index Line on Guard.
47. Hole for Cocking Handle.
48. Trigger.
49. Sear Axis Bearings.
50. Stop for Sear Arm.
51. Trigger Bar.
52. Wedge-shaped Tail of Trigger Bar.

53. Recess in Trigger Bar.
54. T-shaped Arm.
55. Hook of T-shaped Arm.
56. Sear Axis.
57. Block of Sear.
58. Upright Arm of Sear.
59. Downward Arm of Sear.
60. Milled Head of Sear.
61. Strap of Butt Stock.
62. Hole for Elevating Screw.
62A. Catch for Elevating Screw.
63. Piston Rod.
64. Breech Block.
65. Firing Pin.
66. Extractor.
66A. Extractor Spring.
67. Fermeture Nut.
68. Feed Piece.
69. Feed Piece Spring.
70. Recoil Spring.
71. Cocking Handle.
72. Cup of Piston Rod.
73. Internal Collar of Piston Rod.
74. Recesses in Internal Collar.
75. Guides of Piston Rod.
76. Extension of bottom of Piston Rod.
77. Shoulder on Piston Rod.
78. Cam Groove in Piston Rod.
79. Small Block on Piston Rod
80. Large Block on Piston Rod
81. Cam Surfaces on
82. Piston Rod.
83. Recess to engage Sear.
84. Flanges of Breech Block.
85. Slot for Firing Pin
86. Recess for Firing Pin.
87. Interrupted threads.
88. Hood for Extractor.
89. Lower Boss of Firing Pin.
90. Upper Boss of Firing Pin.
91. Screw Thread in Fermeture Nut.
92. Cylindrical Portion of Fermeture Nut.

93. Depression to allow Strip to pass.
94. Boss of Fermeture Nut.
95. Undercut Stud of Feed Piece.
96. Lever of Feed Piece.
98. } Arms of Feed Piece.
97. }
99. Bottom of Feed Piece Stem.
100. Tongue of Feed Spring.
101 Stud on Feed Spring for removal.
102 Hole in Feed Spring.
103. Stud to retain Feed Spring.
104. Tooth of Feed Spring.
105. Lever of Cocking Handle.
106. Knob of Cocking Handle.
107. Disc of Cocking Handle.
108. Stem of Cocking Handle.
108A. Projection on disc.
109. Recesses in disc.
110. Tenons of Cocking Handle.
111. Nibs of tenons.
112. Longitudinal
113. Grooves in Cocking Handle.
114. Opening in Wall between Grooves.
115. Lugs of Cocking Handle.
116. Feed Strip.

17.—METHOD OF CARRYING GUN AND AMMUNITION ON MARK IV OR MARK IV* BICYCLE (Plates IX to XII).

Clips are provided which allow the gun to be carried in either of two alternative ways:—

(*a*) Diagonally through the frame.
(*b*) Above the handle-bars.

The former, in which the weight is carried low, is the more convenient when long distances have to be traversed, while the latter allows the gun to be quickly removed from the bicycle and is intended for use when action is imminent.

In both methods of carriage the kit carriers need not be removed from the bicycle.

The ammunition box is carried on another machine, a special carrier being provided which takes the place of the rear kit carrier. Straps are, however, provided which allow the greatcoat to be fitted on the top of the ammunition box carrier. The front kit carrier need not be removed from the bicycle.

The ammunition bicycle is also provided with clips on the top tube to carry the spare barrel.

The detail of accessories provided, and the instructions for fitting them to the bicycle, are given below:—

The bicycle carrying the gun will be equipped with the following accessories:—

Clips, bicycle, No. 1. } Butt } For carrying the gun over the
} Front } handle bar.
Clips, bicycle, No. 2. } Butt } For carrying the gun through
} Front } the frame.
Strap, bicycle, rest, barrel.
Gaiter, bicycle.

The bicycle carrying the spare barrel and ammunition box will be equipped with accessories, as follows:—

Carrier, bicycle, box, ammunition (with straps for ground sheet and greatcoat).

Clips, bicycle, spare barrel, breech and muzzle (mounted on top tube).

Instructions for fitting clips, carrier, gaiter and strap—(i) Bicycle with gun. Before fitting the clips the tool bag must be removed from the top tube and attached to the back of the saddle:—

(*a*) For carrying the gun over the handlebar:—

Clip, bicycle, butt, No. 1, is fitted on the top tube of the bicycle 7⅛ inches in front of the seat pillar stem, so that the carrying clip itself is on the off-side of the bicycle.

Clip, bicycle, front, No. 1, is fitted on the handlebar, being secured to the handlebar stem so that the gun clip rests firmly on the top of the handlebar lug.

NOTE.—With the No. 1 clips the gun is carried barrel **upwards** and is supported and held in No. 1 butt clip by the small of the butt, close in rear of the grip. The front part of the body of the gun is supported and held in No. 1 front clip, so that the feed piece spring is clear and to the rear of the clip.

(*b*) For carrying the gun through the frame:—

Clip, bicycle, butt, No. 2, is fitted on the near side of the head tube abutting on the bottom lug. If the front carrier is retained on the bicycle, the carrier must be raised on the ball head so as to allow sufficient space for the No. 2 clip to be fitted, and also to afford clearance for the gun to be mounted and dismounted.

Strap, bicycle, rest barrel, Hotchkiss ·303 gun is laced to the top tube 2¾ inches from the ball head top lug, with the quick release buckle on the near side of the bicycle.

Gaiter, bicycle. This is recessed to accommodate the upper pump, clip, and is laced to the seat tube 1½ inches below the seat lug. The lacing must lie to the rear of the seat tube.

NOTE.—With the No. 2 clips the gun is carried barrel **downwards**, and is supported and held in No. 2 butt clip by the small of the butt close in the rear of the grip. The forepart of the gun is supported and held by the No. 2 front clip, in which the plain part of the barrel rests, 9¼ inches from the muzzle. The legs of the barrel rest are secured and held to the top tube by the strap. To enable the gun to be placed in the clips, the barrel rest must not be detached from the gun, but the **legs** of the rest must be released from their retaining spring catches on the gun, and swivelled to the left away from the gun. When the gun has been fixed in the clips the legs of the rest can then be secured to the top tube of the bicycle by means of the quick release strap provided.

(ii) Bicycle with spare barrel and ammunition box:—

Carrier, bicycle, box ammunition, is fitted on the back hub spindle and to the backstays just above the bridge. To enable this to be done the carrier kit, Mark II, rear, and hub washers must be removed from the bicycle.

Clips, bicycle spare barrel:

Clip, breech, is fitted to the top tube of the bicycle 2⅜ inches behind the ball head top lug, so that the carrying clip is on the off-side of the bicycle.

Clip, muzzle, is fitted to the top tube of the bicycle 9 inches from the seat pillar stem, so that the carrying clip is on the off-side of the bicycle.

NOTE.—The spare barrel is carried on the off-side of the top tube with the muzzle towards the seat lug and with the gas regulator directly upwards. To enable the barrel to be placed in, or removed from, the clips, the wheel should be turned to the left.

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18. DESCRIPTION OF AND CONTENTS OF CART, HAND, HOTCHKISS MACHINE GUN (Plates XIII and XIV).

The cart is generally similar to the "Cart, hand, Lewis machine gun" from which it differs chiefly in the internal fittings of the store box. It consists principally of a detachable store box on a steel framed under-carriage and is provided with a draught handle, the whole being mounted on an axletree with two wheels of the bicycle type having flat solid rubber tyres. When worn out the draught handle will be replaced by a pair of shafts.

The **under-carriage** consists of a frame of angle steel raised above and supported on the axletree by means of one transverse and two longitudinal brackets of flat bar steel and four steel bracing stays.

Angle brackets of flat bar steel are fitted at each end to prevent the ends of the frame fouling the ground, and a prop is pivoted in a bracket fitted on the underside at each corner of the frame so that, by lowering the props, the under-carriage and box can be maintained in the horizontal position when required. The props are held in the lowered or raised position by means of a spring plunger.

The draught fittings consist of a draught handle of tubular steel, which can be connected to either end of the cart, and a loop fitted to each corner of the frame for the attachment of a drag rope. When not in use the handle is housed beneath the cart by means of a spring clip and two leather straps attached to the frame.

Brackets are fitted on each side of the frame, which, in conjunction with similar brackets provided on the box, enable the latter to be secured to the under-carriage by means of the pins with split keys attached to the frame by wire rope and staples.

The **store box** is generally similar to the store box of the "Cart, hand, Lewis machine gun," a certain number of which have been converted to carry a Hotchkiss gun with equipment, together with 2,400 rounds of ammunition in strip boxes. The conversion consists in increasing the depth of the box by 1·5 inches, removing and re-arranging the internal fittings and in fitting 2 pairs of quick release straps to the outside of the lid for securing the drag ropes.

The box is of wood, and is fitted with a sloping lid in two canvas covered portions which are attached by hinges to the sides and are highest at the meeting joint. A covering batten with latch is fitted to one of the portions of the lid, the former being so arranged as to ensure a close joint and prevent the ingress of water at the meeting joint when the lid is closed. Two plates, marked "open" and "closed" respectively, are secured to one of the portions of the lid to indicate the correct position for the latch when opening or closing the box.

A spring catch, secured to the lid, engages a recess in a collar on the latch and retains the latter in the closed position.

The box is provided with leather covered handles for lifting or carrying purposes, two at each end, and two handle bars at each side, the latter also serving as rests for the lid when open.

Brackets are provided on the sides of the box to enable the box to be secured to the under-carriage.

A leather wallet, to contain an oil can, adjustable spanner and hub spanner, is secured by means of screws and washers to the inside of the store box at the end opposite the muzzle of the gun.

CONTENTS AND WEIGHTS.

—	cwt.	qr.	lb.
Cart, empty, with drag ropes	2	1	25
Gun (with tripod assembled)	0	1	23¾
Barrel (spare)	0	0	11
Box, spare parts and tools (filled) ...	0	0	12¼
Box, machine filling ammunition feed strips (filled).	0	0	24
Boxes, feed strip ammunition (each containing 10 feed strips filled each with 30 rounds of ammunition—total 2,400 rounds).	1	3	20
Wallet, leather, with tools for cart (approx.).	0	0	5
Total weight of cart filled ...	5	0	16

Articles.	No. per Gun.				No. per Ammn. Set.	Remarks.
	Gun Set.	No. 1 Equipt.	No. 2 Equipt.	No. 3 Equipt.		
Section No. 5A.						
Harness, P.D.G.S.—						
Cases, horseshoe	1	...	...	...	1	
Section No. 5B.						
Packsaddlery, G.S.—						
Bits, bridoon	1	...	...	...	1	
Breechings, Mark V	1	...	...	...	1	
Collars, breast, Mark V ...	1	...	...	...	1	
Collars, head, Mark IV ...	1	...	...	...	1	
Cruppers, Mark V	1	...	...	...	1	
Girths, leather	1	..	...	...	1	
Straps, girth, Mark II ...	4	...	...	...	4	
Packsaddlery, M.G., ·303 inch—						
Sticks, leading	1	...	...	...	...	
Section No. 6A.						
Reins, bit	1	In possession			1	
Section No. 5 (N.I.V.)						
Caps, shovel, Hotchkiss ...	1	...	...	...	...	
Case, spare barrel, Hotchkiss, Mark II	1	...	...	...	...	
Cover, gun, Hotchkiss	1	..	...	...	...	
Carriers, ammunition, Hotchkiss	4	...	...	...	6	
Carriers, straps, retaining, 3-carrier	2	...	...	...	4	

Articles.	No. per Gun.				No. per Ammn. Set.	Remarks.
	Gun Set.	No. 1 Equipt.	No. 2 Equipt.	No. 3 Equipt.		
Section No. 5 (N.I.V.)—cont.						
Carriers, straps, retaining, 1-carrier	2	...	...	...	...	
Carriers, straps, handle, releasable	1	...	...	...	2	
Girths, Mark V, Hotchkiss ...	2	...	...	..	2	
Pannels, Hotchkiss ... pairs	1	...	...	...	1	
Rack, ammunition, Hotchkiss	1	...	...	...	2	
Straps, shovel, Hotchkiss ...	2	...	...	...	...	
Tree, gun, adjustable, Hotchkiss	1	...	...	...	...	
Tree, ammunition, adjustable, Hotchkiss	...	...	...	...	1	
Section No. 6 (N.I.V.)						
Bucket, gun, Hotchkiss		1	...	...	...	
Bucket, straps, trunnion attachment	...	1	...	...	...	
Bucket, gas cylinder and hind arch attachment	...	1	...	...	...	
Bags, saddle, Hotchkiss ...	...	1	...	...	...	
Bags, straps, steadying ...	...	1	...	...	...	
Girth, balancing, Hotchkiss ...	...	1	...	...	...	
Girth, straps, attachment ...	...	1	...	...	...	
Girth, straps, connecting ...	...	1	...	...	...	
Wallets, ammunition, Hotchkiss pairs	...	1	1	1	...	
Wallets, straps, guide	...	2	2	2	...	
Wallets, front arch attachment	...	1	1	1	...	

DESCRIPTION OF ITEMS COMPRISING THE SETS.

Cases, Horse Shoe.

This shoe case is similar in pattern to that formerly used for harness purposes. It mainly differs from the saddlery pattern in that no tube for the sword exists, and that the shoe case strap is permanently affixed, and is not detachable as in the case of the saddlery shoe case.

Bits, Bridoon.

Is an ordinary bridoon bit, but tinned to prevent rust. The mouthpiece is fitted at each end with a ring to receive the iron stops on the reins, when the ordinary packsaddlery reins are used, or for universal saddlery reins to buckle to. The "T" pieces are secured to the rings by links and solid loops, and are for fitting under the leather loops on the packsaddlery head collar.

Breechings, Mark V.

Are used for preventing the packsaddle from slipping forward. Its straps are looped to the links on the pannels and then buckled to the breeching itself. It is supported by its hip strap, which passes through a loop on the crupper before buckling.

Collars, Breast, Mark V.

Are used to prevent the load from slipping back. The straps are looped to the links on the pannels.

and then buckled to the breast-collar itself. It is supported by its own neckstrap.

Collar, Head, Mark IV.

Similar in design to the universal saddlery head-collar, but the furniture is tinned iron, and it is fitted on the lower part of the headpiece with leather loops for the "T" of the bridoon bit to fit into, and with a ring on the noseband.

Crupper, Mark V.

Is made with forked straps which are looped to the rear arch of the packsaddle and then buckled to the body of the crupper. The use of the crupper is to assist in preventing the saddle slipping forward.

Girth, Leather.

Is a leather steadying girth with a billet and buckle at each end. It acts as a steadying girth for certain loads.

Straps, Girth, Mark II.

Are for buckling the packsaddle girths to. They are of leather, and made with a loop at one end.

Stick, Leading.

Is a stick fitted at one end with a billet and buckle, and at the other end with a leather loop. A loop in the centre is also provided. It is intended for use

with Cavalry to prevent the animal, carrying the gun, from pressing in on the leg of the rider leading it.

Reins, Bit.

Are of the universal saddlery pattern.

Cap, Shovel, Hotchkiss.

Is a leather cap made to fit on the "pan" of the G.S. shovel. It differs from the ordinary shovel cap in that the fitting for the detachable strap is on the front of the cap instead of the back.

Case, Spare Barrel, Mark II.

Is a leather case made to take the spare barrel. It is provided with a cap, as also leather loops, which fit over the off-side prongs of the brackets on the movable standard of the gun tree.

A shaped leather sling, made in two portions to provide adjustment, is attached, and allows of the case being slung over a man's shoulder when removed from the pack saddle.

Carrier, Ammunition.

This is a rectangular leather case made to take 300 rounds of ammunition in strips of 30. It is lined

internally with felt to prevent noise when moving, and provided with leather handles for carrying purposes. A leather draw-strap is affixed to the inside at the bottom to assist in withdrawing the ammunition strips.

Strap, Retaining, 3-Carrier.

Strap, Retaining, 1-Carrier.

Are straps for securing the ammunition carriers.

The 3-carrier strap is for use with the ammunition rack and its three ammunition carriers.

The 1-carrier strap is special for the one ammunition carrier under the gun.

Strap, Handle, Releasable.

This is for securing the handle of the top ammunition carrier to the packsaddle tree. One only is requisite in the case of the gun set, but two are necessary for the ammunition set, as the carriers are on both sides of the tree.

Girth, Mark V Hotchkiss.

This girth is similar in design to the ordinary G.S. packsaddlery girth, but is 3 inches shorter.

Pannels, Hotchkiss, Pairs.

Differ from the G.S. packsaddle pannels in the following respects:—

(1) Slots are made through the substance of the "lay" of the off-side pannel to allow the retaining straps for the carriers to pass through.

(2) Two loops for the shovel straps are riveted on the "off-side" pannel below the "lay."

(3) A leather loop is riveted obliquely to the rear of the off-side pannel for the detachable strap of the shovel cap to attach to.

Rack, Ammunition, Hotchkiss.

This is a leather-covered metal tray with wide leather suspension slings for attaching to the hooks of the packsaddle. A fixed leather strap is riveted under the bottom for securing the bottom ammunition carrier, as also a metal loop for the leather girth to attach to, and a leather band retains the two slings.

Straps, Shovel, Hotchkiss.

Are two short straps for securing the shovel handle to the loops on the pannel.

Tree, Gun, Adjustable, Hotchkiss.

The front arch and sidebars are similar to the ordinary adjustable packsaddle, but the hind arch is made with slots into which the top movable standard can be moved. A connecting-rod joins the front and rear arches, and on it are two brackets for the spare barrel case, while a short spiral spring on the connecting-rod keeps the movable standard in the desired position.

Brackets with clips are provided on the off-side for the gun, and webbed hooks on the near-side for the ammunition rack to attach to.

Tree, Adjustable, Ammunition, Hotchkiss.

This tree only differs from the ordinary adjustable packsaddle tree in that the hooks are cranked and "webbed" so that the points of the hooks are farther apart.

Saddlery.

Bucket, Gun, Hotchkiss.

Consists of a shaped length of leather with a bucket for the stock to rest in, and folding flaps with releasable fittings to protect the breech. It is fitted with a steadying strap to connect with the surcingle, and a suspending strap for attaching to the hind arch of the saddle, also with a V-shaped attachment to buckle to the balancing girth.

It is lined with felt at the back where contact with the horse is possible, and a felt lining is provided on the front where the gun rests against the side.

Strap, Trunnion, Attachment.

Is an attachment fitted with a tongueless buckle which acts as a quick release. It is fastened round

the gun below the trunnion, and secured to the cantle of the saddle by a strap and buckle, thus steadying the gun when on the move.

Gas Cylinder and Hind Arch Attachment.

Is in two parts—(1) a strap which loops to the staple on the hind arch of the saddle; and (2) strapping fitted with a buckle and strap at one end to connect with the strap at (1), and at the other end with a spring hook to snap on to the stay which joins the barrel and gas cylinder. This half of the attachment is joined in the centre by a quick release.

Girth, Balancing, Hotchkiss.

This girth is to balance the gun bucket when the gun is transferred from the packsaddle to a riding saddle.

It is in three parts:—(1) The **girth** itself, which is an ordinary single-web girth fitted with a chape carrying a buckle at each end; (2) a **connecting strap**, which connects this girth with the girth belonging to the saddle and prevents the former girth from slipping back; and (3) an **attachment strap**, which loops to the link on the off-side numnah pannel.

Wallets, Ammunition, Hotchkiss.

Are specially constructed to take 120 rounds of ammunition (4 strips of 30 rounds) in each, or 240 rounds in the pair.

Each pair of wallets are joined together with a connecting band of leather, to the centre of which a releasable strap with draw strap is attached. A slot is made in the connecting band for the link of the front arch attachment to pass up through.

Front Arch Attachment.

Is a brass attachment with a fixed link, made to fit over and buckle round the centre of the front arch of the saddle.

Guide Straps.

These are shaped so that the ammunition wallets may pass through them. An extension with a loop to slip on the front girth strap is arranged in each guide strap.

The object of the straps is to retain the ammunition wallets to the saddle, but in such a manner as to allow of them being withdrawn from the guide straps as the rider dismounts.

Bag, Saddle, Hotchkiss.

Is a saddle bag made with a single gusset to carry the articles shown in the Load Table (No. 1 horse).

It is fitted with a suspending strap for attaching to the hind arch of the saddle, and with a link at the top of the flap and a loop towards the lower edge for attaching the mess tin and horse brush.

A link at the rear front edge carries the retaining strap.

TO ASSEMBLE THE PARTS.

Packsaddlery.

The pannels and the girth straps are attached to the packsaddle tree in the ordinary manner.

STRAPS, RETAINING, 3-CARRIER.

The releasable link ends of the buckle portions are passed up under the near-side bar of the gun packsaddle tree (both side bars of the ammunition tree) to the front and rear respectively of the girth straps, and arranged so that when secured over the three carriers the quick release attachment will be about in line with the bottom of the top carrier.

STRAPS, RETAINING, 1-CARRIER.

The points of the straps are passed down behind the off-side bar of the gun packsaddle tree, to the front and rear respectively of the girth straps, then through its own fixed loops, then through the sliding loops, and afterwards through the slots in the "lay" of the pannel and back through the sliding loops again. The straps are in position for loading when the fixed loops are drawn tight to the side bar.

STRAPS, HANDLE, RELEASABLE.

The strap for the gun set is looped round the off-side bar of the packsaddle tree—the two straps for the ammunition set are similarly attached, one to each side bar.

CASE, SPARE BARREL.

Is to be placed in the pillar brackets of the movable standard on the gun packsaddle, the fixed loops passing over the off-side prongs of the front and rear

brackets. The case is secured in position by buckling the straps on the brackets.

STRAPS, SHOVEL, HOTCHKISS.

The straps are to be attached to the fixed loops on the off-side pannel of the gun packsaddle by passing them through, points downwards.

Saddlery.

BUCKET, GUN, HOTCHKISS.

Suspend the bucket to the near hind arch of No. 1 saddle by the suspending strap, and button the steadying strap round the front girth strap of the V-girth attachment.

GIRTH, BALANCING, HOTCHKISS.

Loop the atachment strap to the link on the off-side numnah pannel of No. 1 saddle, and slide the connecting strap on to the girth. Then buckle one end of the girth to the attachment strap.

STRAP, TRUNNION ATTACHMENT.

Pass the strap end up through the cantle of No. 1 saddle and buckle tightly.

STRAP, GAS CYLINDER AND HIND ARCH ATTACHMENT.

Loop the strap to the rear staple on the off-side of No. 1 saddle, and buckle the other portion to it.

FRONT ARCH ATTACHMENT.

Place the attachments over the centre of the front arches of Nos. 1, 2 and 3 saddles with the link up, and then buckle underneath.

Straps, Guide.

Unbuckle the front girth strap on each side of the saddles of Nos. 1, 2 and 3, then slip the loops of the extensions of the guide straps over them and buckle again.

Wallets, Ammunition, Hotchkiss.

Place the wallets over the front of the saddles of Nos. 1, 2 and 3, with the slots in the connecting band to the front. The link of the front arch attachment passes up through the slot in the connecting band, and is secured by the releasable strap.

The ends of the wallets pass down through the guide straps.

Bags, Saddle, Hotchkiss.

Suspend to the off-side of the hind arch of No. 1 saddle. Button the steadying strap round the rear girth strap of the V-girth attachment.

Loading.

Gun.—The gun is placed in the gun brackets on packsaddle with the tripod affixed and the gun cover on, with the breech to the rear. The front gun bracket should grip the gun round the tripod and the gas escape hole in the handguard, while the rear bracket should grip immediately in front of the trigger guard. These particular parts of the gun are not visible when the gun is in the cover, and to ensure the correct position being obtained it is requisite to place

the gun well forward in the brackets and then draw it to the rear till the tripod comes against the projection on the bracket connecting stay rod, which is the limit to which it can be drawn back. To allow of fitting in the brackets, it is necessary that any loose portions of the cover which come within either of the brackets should be folded.

In the absence of the gun cover, a piece of leather or sacking placed at the bottom or sides of the brackets will prevent movement of the gun.

Ammunition Rack.—One ammunition rack is required for the gun horse and two for the ammunition horse, and in each case they are suspended from the hooks of the packsaddle, the distance between the hooks admitting of the carriers fitting between them.

Ammunition Carriers.—Ammunition carriers are to be always placed with the fastening studs next to the pannel of the packsaddle.

One carrier is suspended under the gun, secured in position by the 1-carrier retaining straps previously affixed to the packsaddle. Three ammunition carriers are placed in each rack and are kept in position by the 3-carrier retaining straps previously affixed, but the bottom carrier is also separately secured by the strap attached to the rack, as in practice it has been found that on coming into action two carriers are a convenient load for a man to handle, and there would thus be the possibility of the third falling out of the shallow rack.

The outer handles of the carriers in the racks are interlaced, and the top handle on either side is secured

by releasable handle straps, which have previously been affixed.

Girth Leather.—The ammunition racks are kept in position by the "girth leather," which passes under the animal's belly and is buckled to the staple under each rack.

Shovel.—The shovel is carried under the single carrier on the off-side of the gun horse, secured by taking a couple of turns round the handle by the two shovel straps previously affixed, and steadied by securing the detachable strap of the shovel cap to the loops halfway up the rear of the pannel.

The shovel is more conveniently carried on the pannel if the handle is shortened 6 inches. This may be done regimentally.

Spare Barrel.—The spare barrel is placed in the spare barrel case.

In this position the spare barrel in its case may be carried vertically as a top load, or by means of the movable standard the weight may be transferred to either side as occasion may demand. Its normal position is on the off-side, but the intention is that it should be used for weight adjusting as required.

As an illustration of such use assuming that the spare barrel is on the off-side, and that the contents of one of the ammunition carriers have been used from the near side (*i.e.*, 20 lbs. weight), the spare barrel could be placed central, when the weights would be 65½ lbs. on the near side, 14 lbs. in the centre, and 67 lbs. on the off-side.

Nosebag, Shoecase, Saddle Bag.—Are suspended from the hind arch of the packsaddle or saddle on the side shown in the load table.

Carriage of Certain Articles by Gun Detachment.—The ordinary saddle wallets and their contents, together with the cloak, mess tin and horse brush having been displaced on the three horses of the gun detachment by the introduction of ammunition wallets, it has been necessary to make other arrangements for their carriage.

For Nos. 2 and 3 the rear fans of the saddles are utilised, the saddlery wallets (packed) being laid across them at full length, with the cloak rolled a suitable length on top, the whole being secured by the baggage straps, to which the mess tin and horse brush are suspended, as shown in the Load Table.

This method is not possible for No. 1, as the rear of the saddle is already taken up by the gun bucket and its accessory parts. A saddle-bag is therefore provided for this set of saddlery, into which the ordinary contents of the saddlery wallets are packed. Fittings exist on the front of this saddle-bag to which the mess tin and horse brush can be attached, the mess tin by its own strap, and the horse brush slung on the mess tin strap by the hand loop. The cloak for this number must be carried under regimental arrangements.

Gun Bucket.—The assembling of the gun bucket and its accessory parts has already been dealt with, and to finally fix it in position it is only necessary to buckle the other end of the balancing girth to the strap on the "V" at the lower edge of the bucket. It is to be particularly noted that the balancing girth

is not to be tightly fastened—it must be left loose or its object is defeated. When the gun is placed in the bucket the girth is automatically tightened.

The gun bucket is only to be used in a case of necessity, as referred to in the introductory remarks, but it forms a normal part of the equipment for No. 1 horse and should always be carried by this number.

Ammunition.—The amount of ammunition per gun is distributed as under:—

On the gun horse	1,200	rounds.
On No. 1 horse	240	,,
On No. 2 horse	240	,,
On No. 3 horse	240	,,
In bandolier with No. 1 ...	54	,,
In bandolier with No. 2 ...	54	,,
Total rounds with gun...	2,028	,,
Add—		
Share for one gun on the ammunition horse ...	900	,,
Total rounds available for gun	2,928	,,

As already alluded to in the introductory remarks, one ammunition horse per two guns is provided, and on it is carried 1,800 rounds, packed in six carriers (three on each side).

Load Tables.—The load to be carried by each horse is as follows :—

Off side.	lbs.	Centre.	lbs.	Near side.	lbs.
		GUN HORSE.			
Hotchkiss gun and tripod	30	Spare barrel in case, resting on off side	14	3 carriers with 900 rounds ammunition	75
1 carrier with 300 rounds of ammunition ...	25			Rack for ammunition carriers	6
Shovel (in cap)	5			Shoecase (filled) ...	4½
Nosebag (filled)	7				
Add—					
Weight of centre load	14				
Total	81	See off side ...	...	Total	85½
		AMMUNITION HORSE.			
3 carriers with 900 rounds of ammunition ...	75			3 carriers with 900 rounds of ammunition	75
Racks for ammunition carriers	6	Nil.		Racks for ammunition carriers	6
Shoecase (filled) ...	4½			Nosebag (filled) ...	7
Total	85½		...	Total	88

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Off side.	lbs.	Centre.	lbs.	Near side.	lbs.
		NO. 1 HORSE.			
Saddlebag, containing articles usually carried in the wallets—about	8	*On front of saddle (in place of the wallets)* 1 pair of ammunition wallets, containing 240 rounds	20	Bucket, gun, Hotchkiss Nosebag (filled) ...	6 7
Mess tin and horse brush suspended to front of saddlebag	2				
Shoecase (filled)... ...	4½				
Total	14½	Total	20	Total	13
		NOS. 2 AND 3 HORSES.			
Shoecase (filled)... ...	4½	*On pommel*—1 pair ammunition wallets containing 240 rounds	20	Nosebag (filled) ... Horse brush	7 1
Mess tin (suspended to off baggage strap of rear load)	1½	*On rear of saddle*—Saddlery wallets packed, with cloak rolled on top ..	17		
Total	6	Total	37	Total	8

To Transfer the Gun from the Packsaddle to the Auxiliary Saddlery Equipment.

The pack horse is halted, No. 1 dismounts, unclips and takes the gun from the gun bracket, withdraws it from the gun cover, places it in the gun bracket attached to his saddle, secures the trunnion attachment strap to the stay, fastens the breech cover of the gun bucket round the gun, mounts and gallops off, accompanied by Nos. 2 and 3.

On nearing the desired position, Nos. 1 and 2 whilst pulling up release the front arch attachment strap (No. 1 also the quick release attachment of the gas cylinder strap), disengage the ammunition wallets from the guide straps, and dismount with them over their left forearms.

When dismounted, No. 1 hands his horse to No. 3 (who has remained mounted and comes up on his off-side), releases the trunnion strap, removes the gun from the bucket, and takes it and the ammunition into action. No. 2 also hands his horse to No. 3, and accompanies No. 1. No. 3 should remain in the vicinity of the gun.

HOTCHKISS MACHINE GUN.

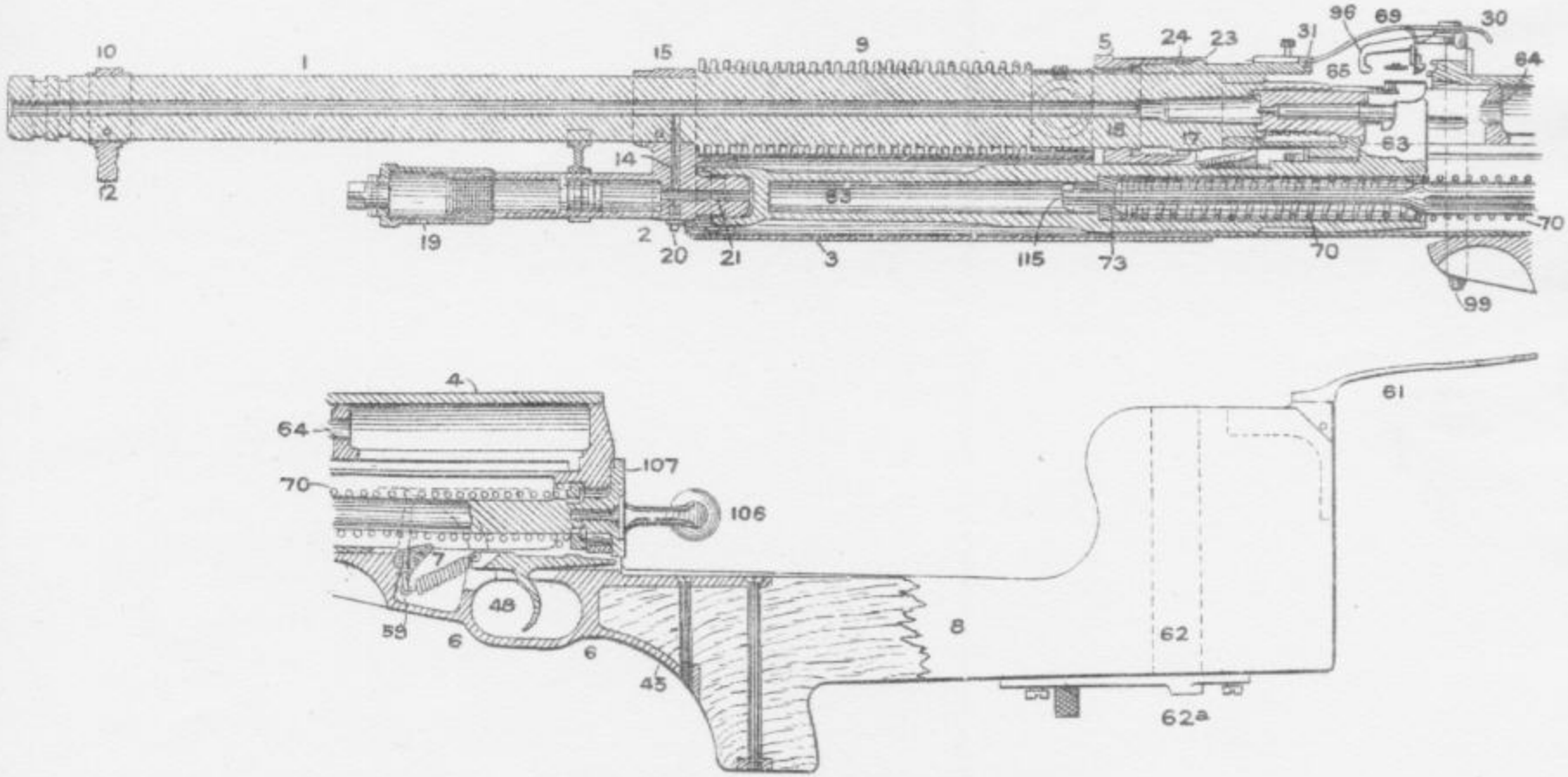
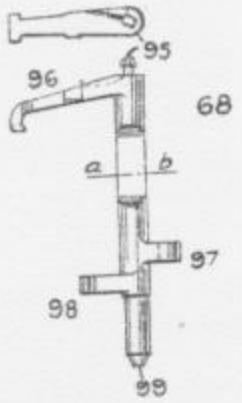


Plate I.

HOTCHKISS MACHINE GUN.



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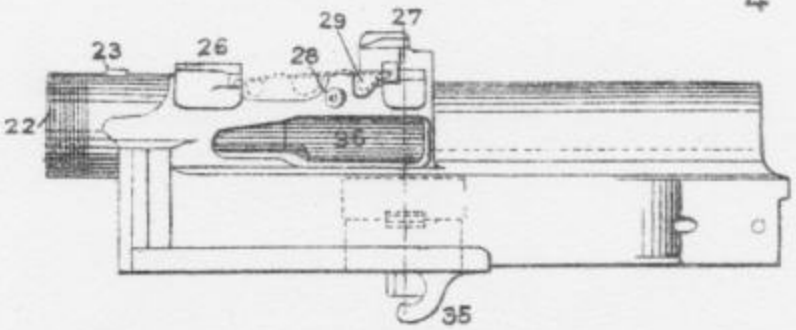
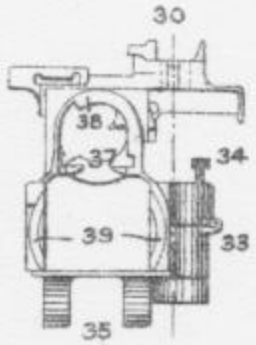
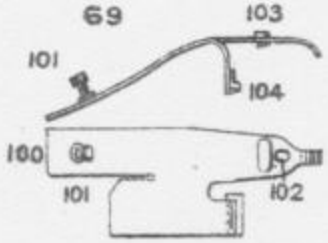






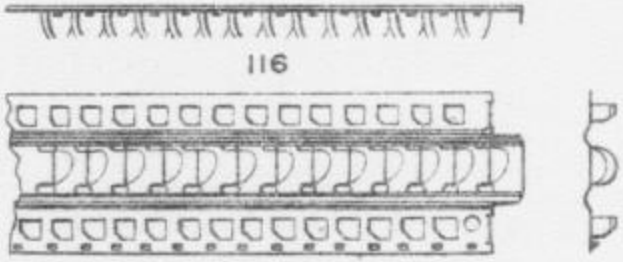


Plate II.

HOTCHKISS MACHINE GUN.

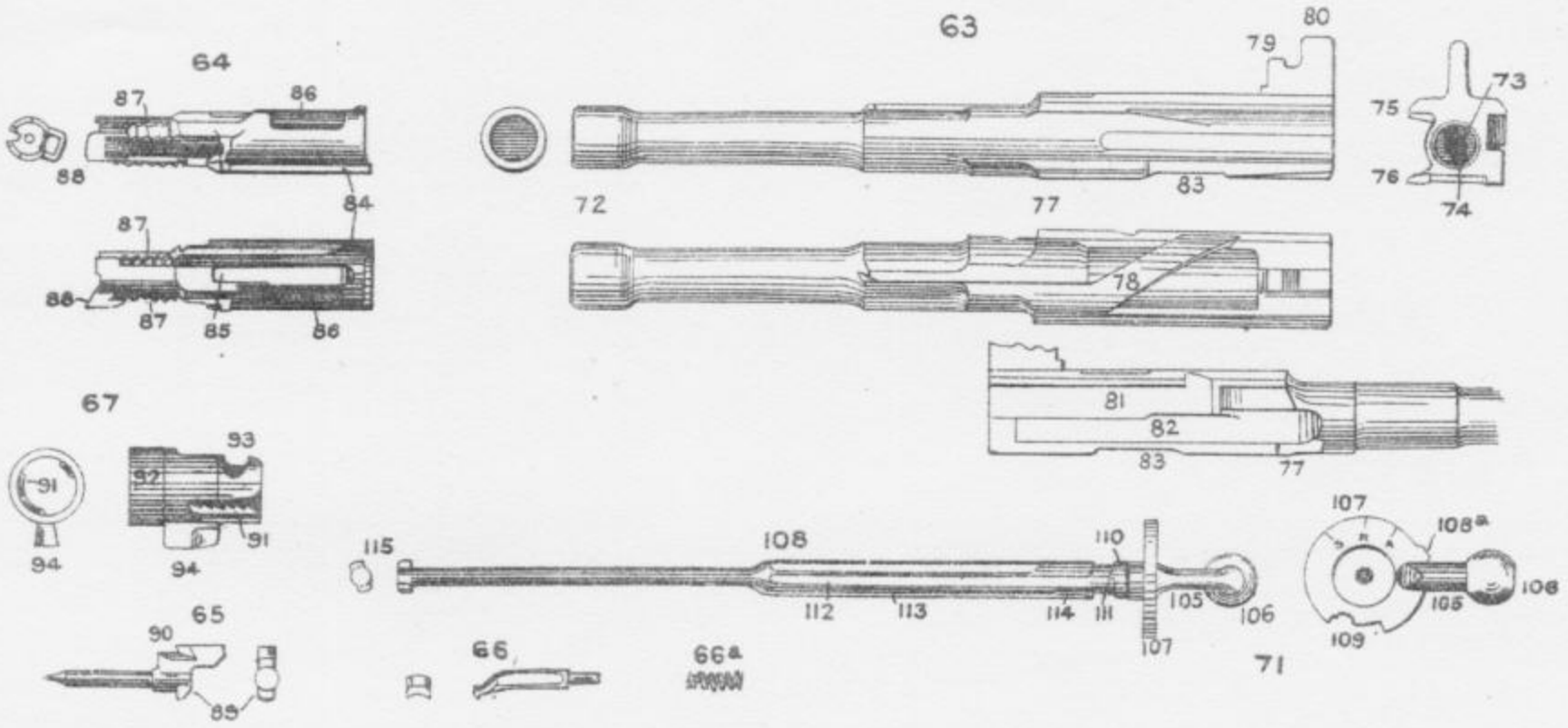
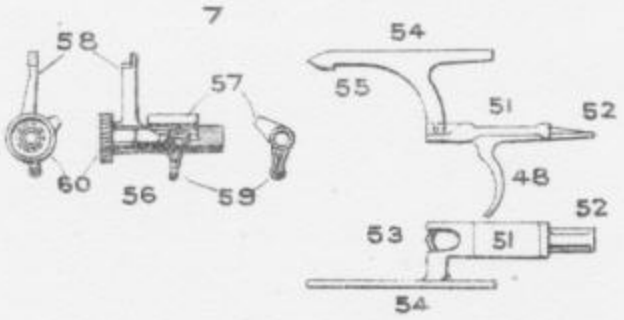


Plate III.

HOTCHKISS MACHINE GUN



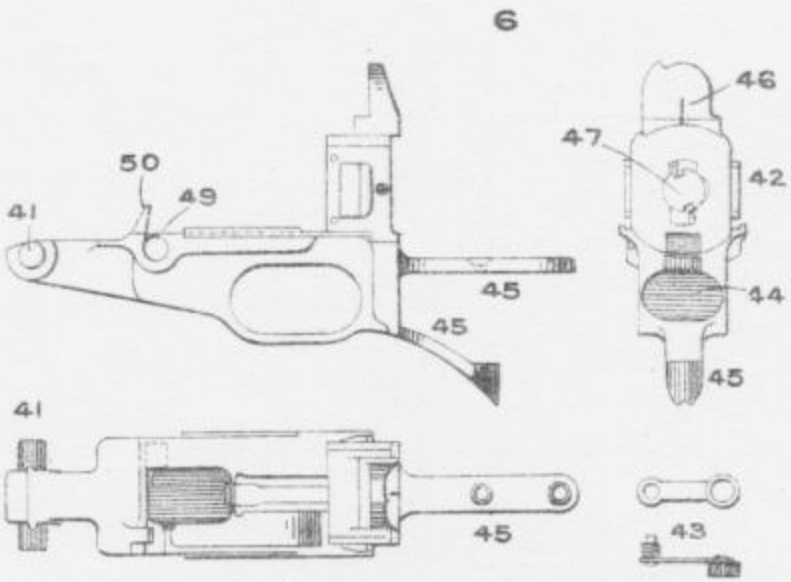


Plate IV.

HOTCHKISS MACHINE GUN.

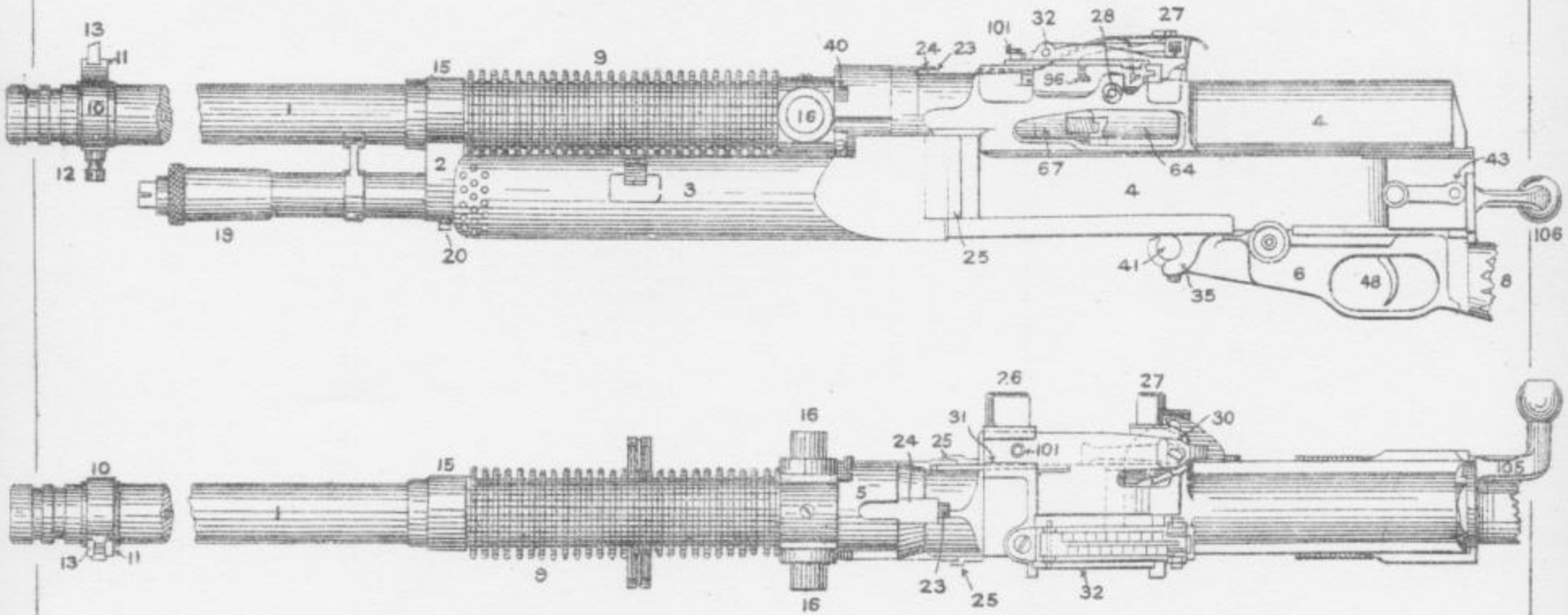


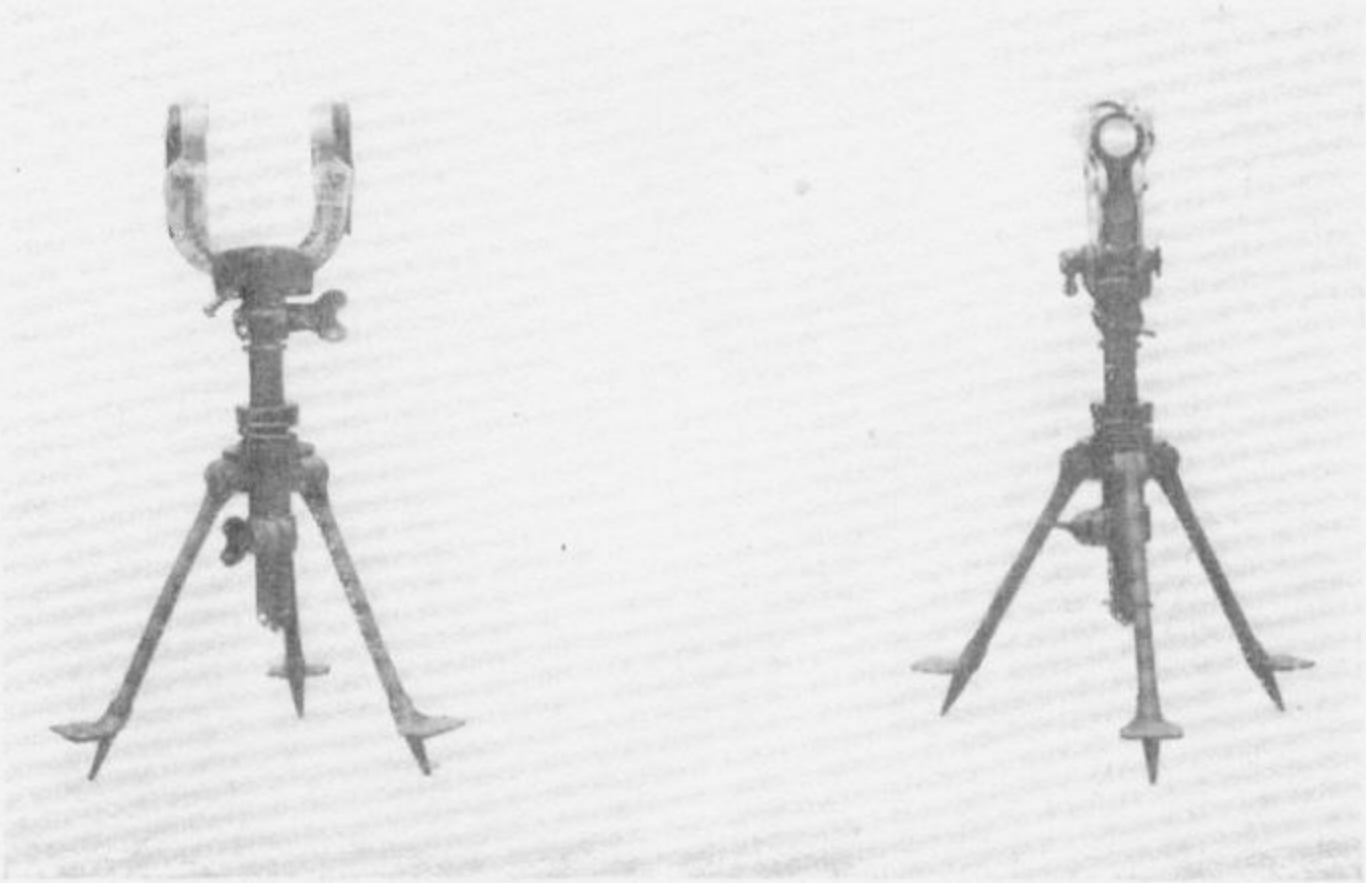
Plate V.

HOTCHKISS GUN ADAPTED FOR TANKS,
and fitted with auxiliary shoulder piece and tripod mounting for use outside the Tank. (Right side.)

PLATE VI.

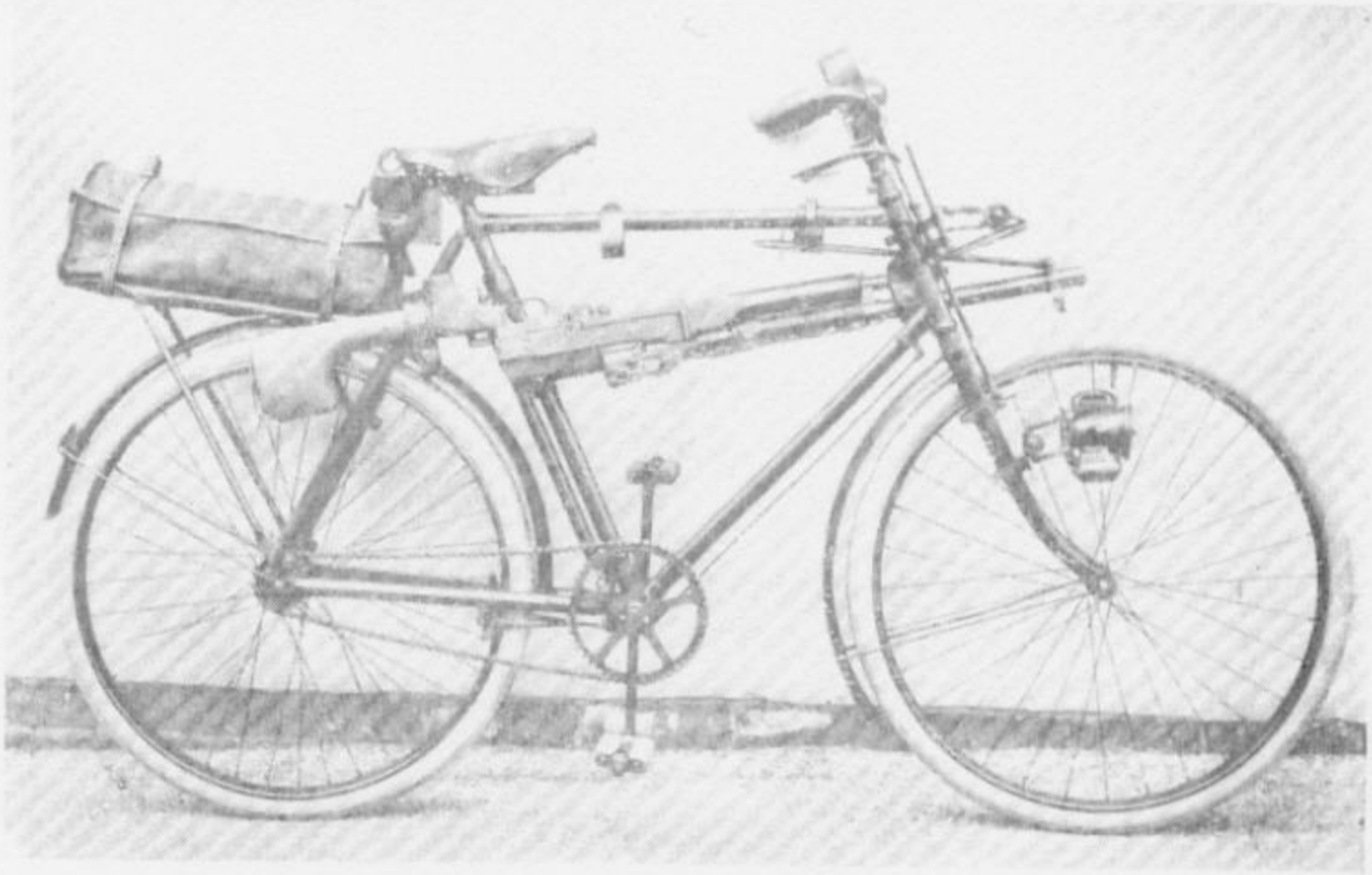
HOTCHKISS GUN ADAPTED FOR USE IN TANK,
and fitted with auxiliary shoulder piece and tripod mounting for use outside the Tank. (Left side.)

PLATE VII.



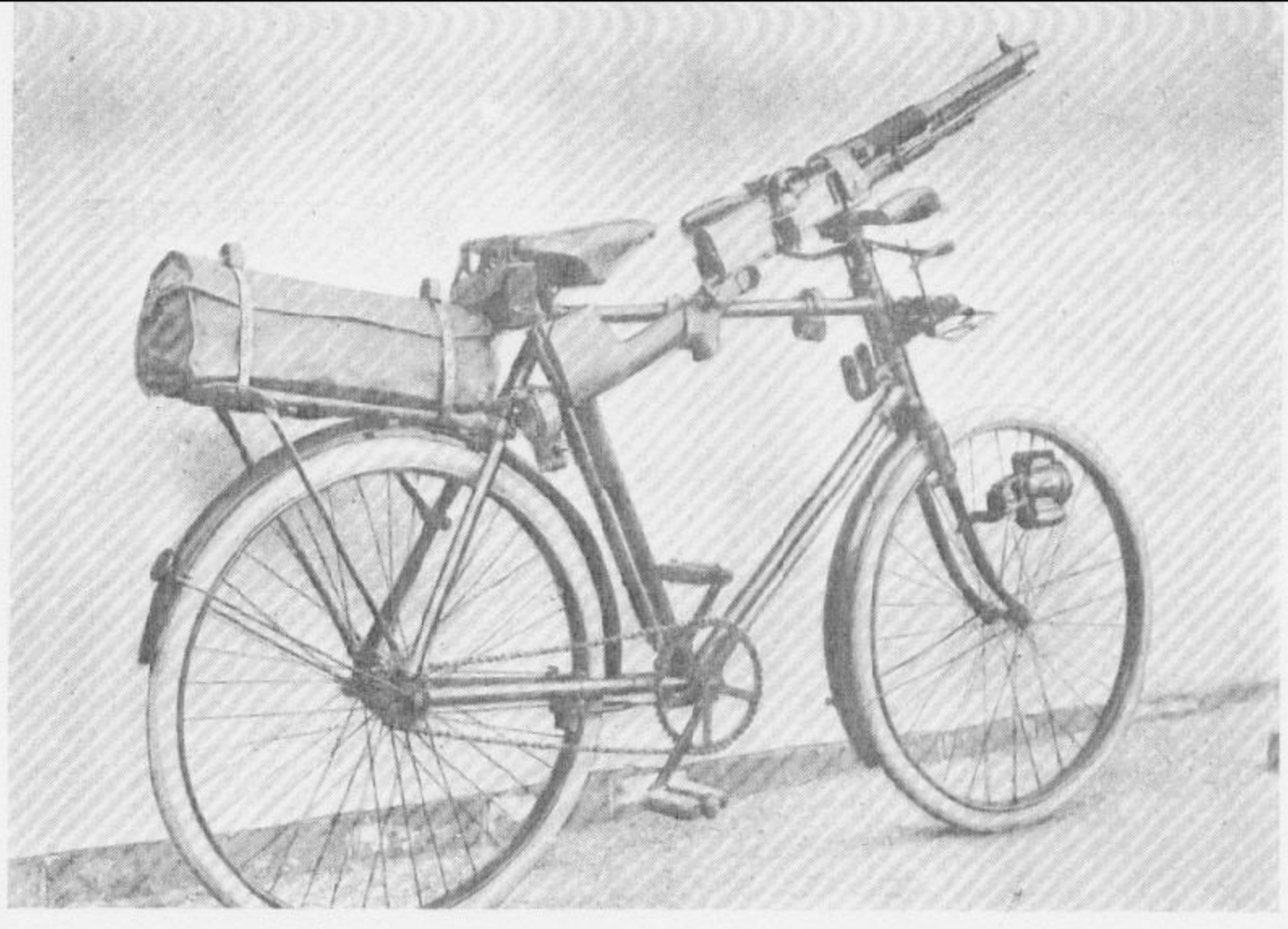
TRIPOD MOUNTING HOTCHKISS GUN.

PLATE VIII.



BICYCLE MARKS IV OR IV*,
with ·303 Hotchkiss Gun carried through frame. (Right side.)

PLATE IX.



BICYCLE MARKS IV OR IV*,
with ·303 Hotchkiss Gun carried over Handie-bar.

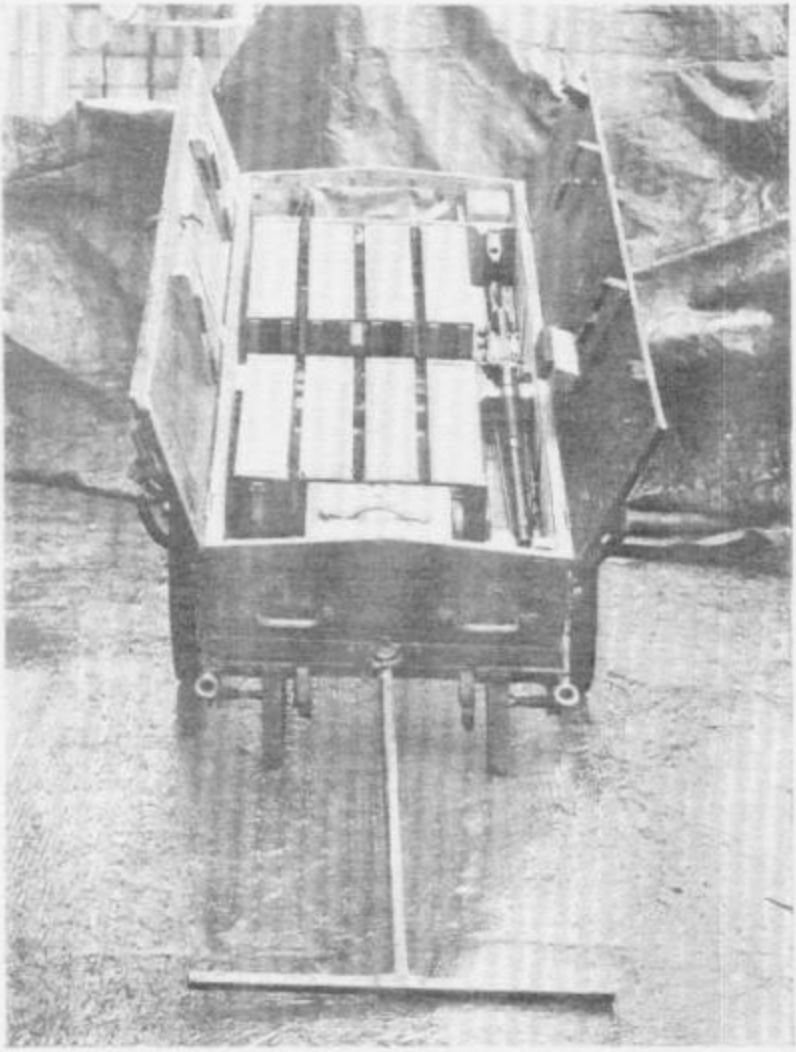
PLATE X.

BICYCLE MARKS IV OR IV*,
with ·303 Hotchkiss Gun carried through frame. (Left side.)

PLATE XI.

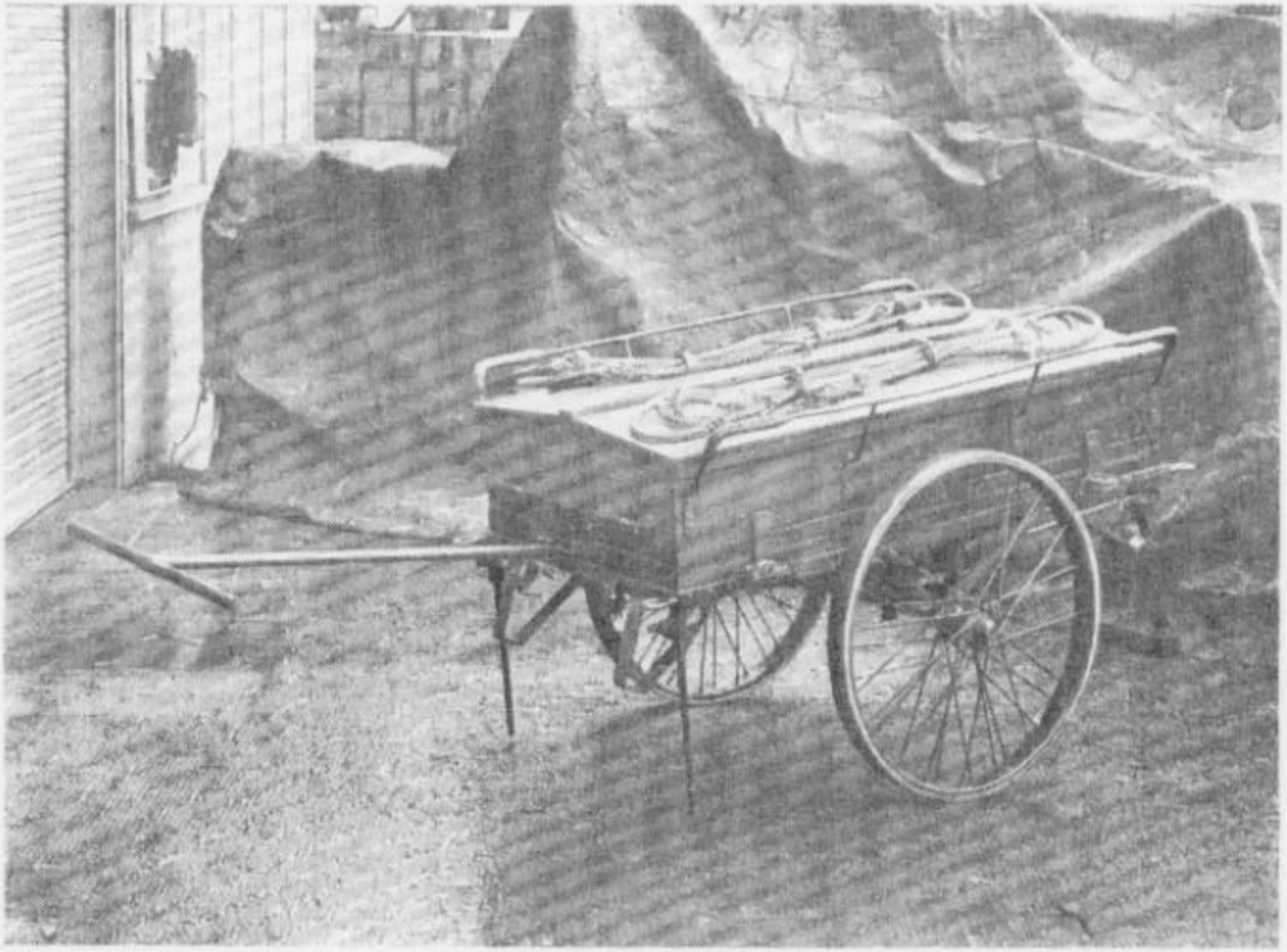
BICYCLE MARKS IV OR IV*,
with spare Hotchkiss Gun Barrel and Ammunition Box.

PLATE XII.



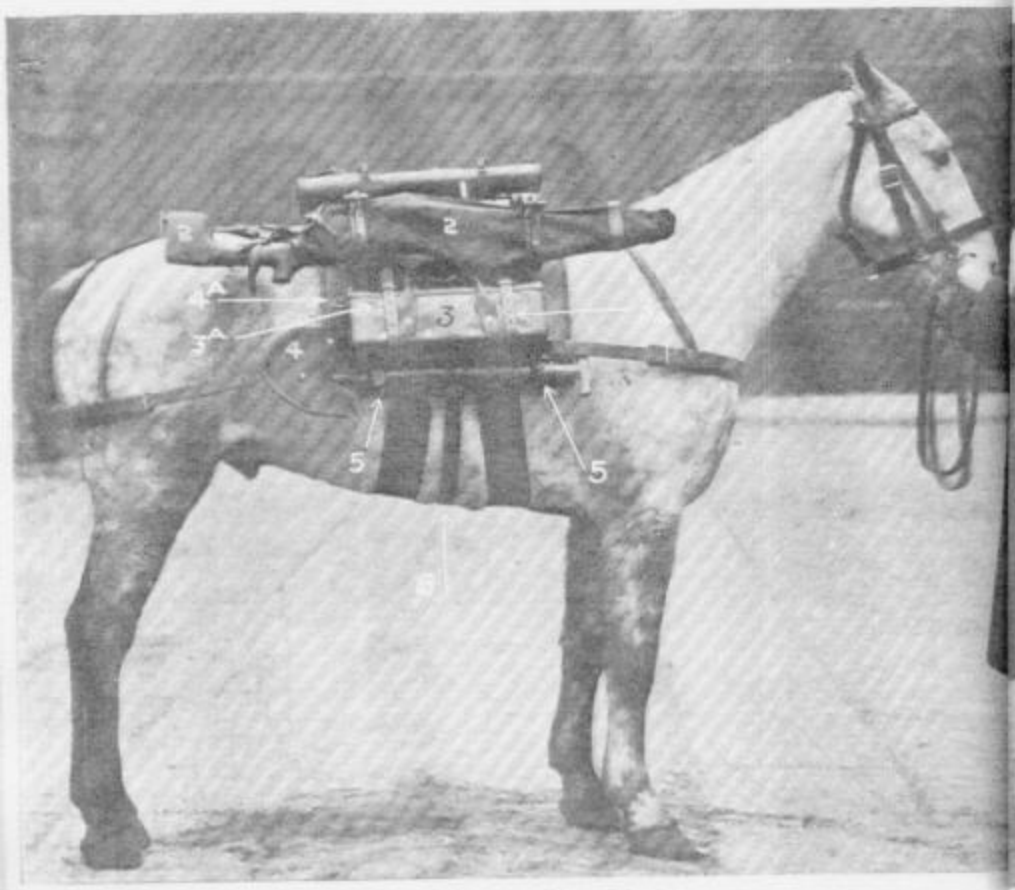
CART HOTCHKISS GUN, PACKED.

PLATE XIII.



CART HOTCHKISS GUN PACKED AND EQUIPPED.

PLATE XIV.

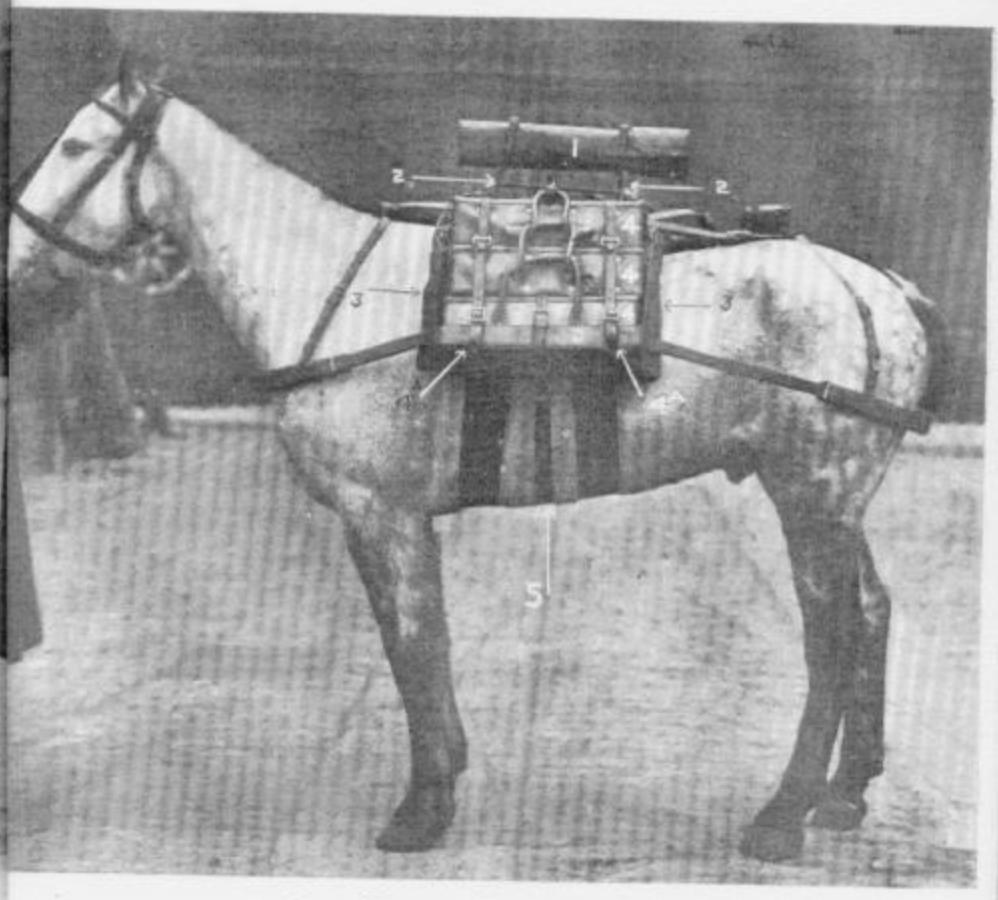


GUN HORSE—OFF SIDE.

(Showing movable standard and spare barrel case in the normal position on off side.)

1. Spare barrel case.
2. Gun, (in the gun cover) in the gun brackets.
3. Ammunition carrier.
3A. Straps, retaining, 1-carrier.
4. Shovel, with handle shortened 6 inches.
4A. Detachable strap of shovel cap.
5. Shovel straps.
6. Girth, leather.

PLATE XV.

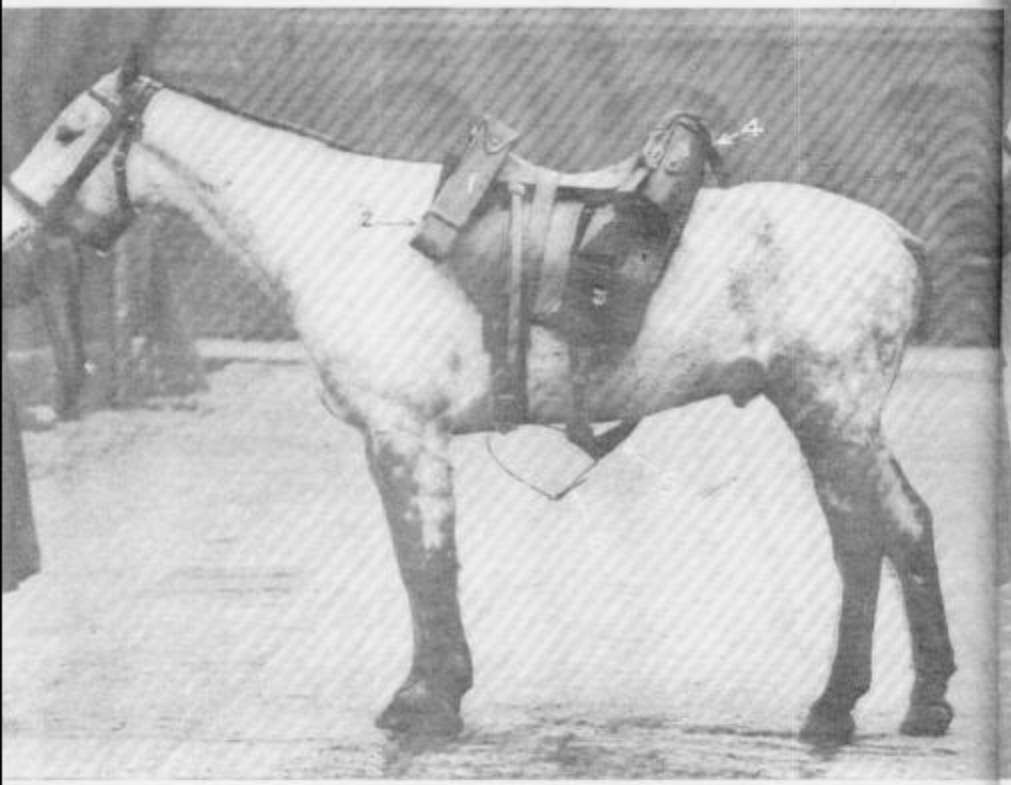


GUN HORSE—NEAR SIDE.

(Showing the movable standard and spare barrel case central.)

1. Spare barrel case in brackets of movable standard.
2. Movable standard.
3. Ammunition rack slung to hooks of packsaddle.
4. Ammunition carriers in the ammunition rack, with handles interlaced, and the top one secured. Also the method of using the 3-carrier retaining straps.
4A. Straps, retaining, 3-carrier.
5. Girth, leather.

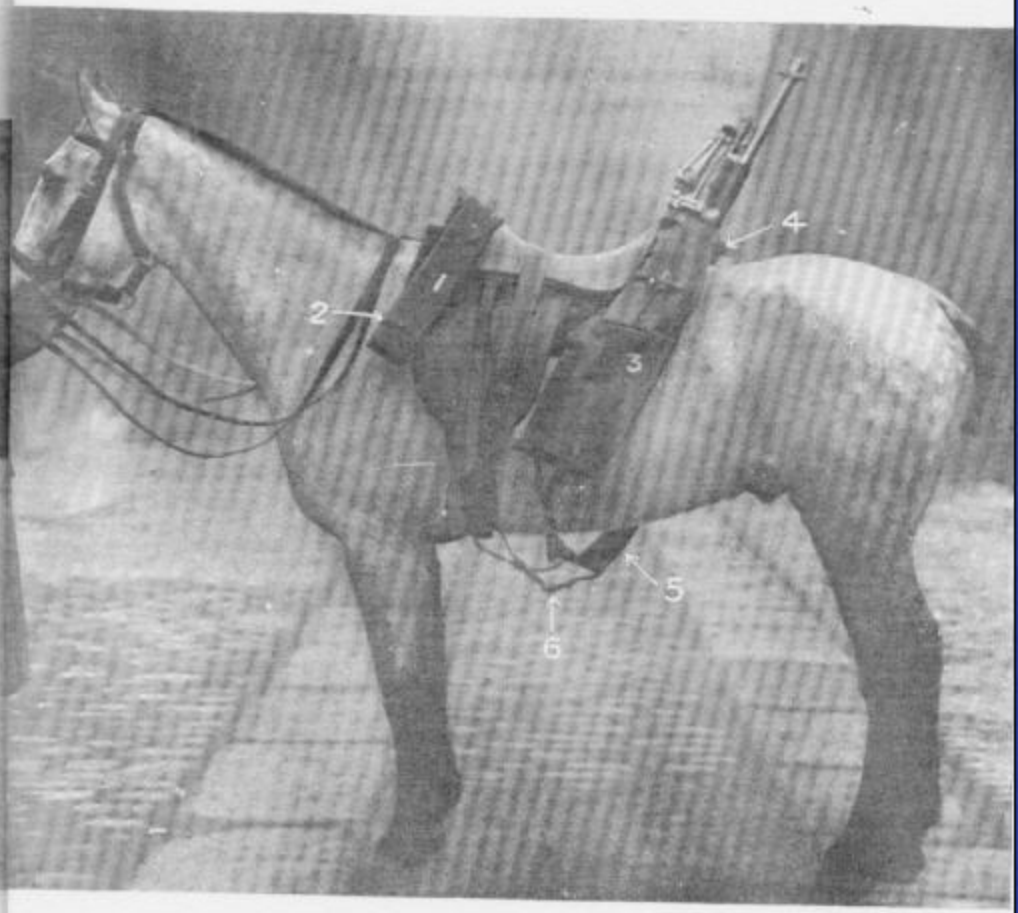
PLATE XVI.



No. 1 Horse—Near Side, without Gun.

1. Ammunition wallets.
2. Guide strap for ammunition wallets.
3. Bucket, gun.
4. Strap, trunnion attachment.
5. Girth, balancing.
6. Connecting strap of "girth, balancing."

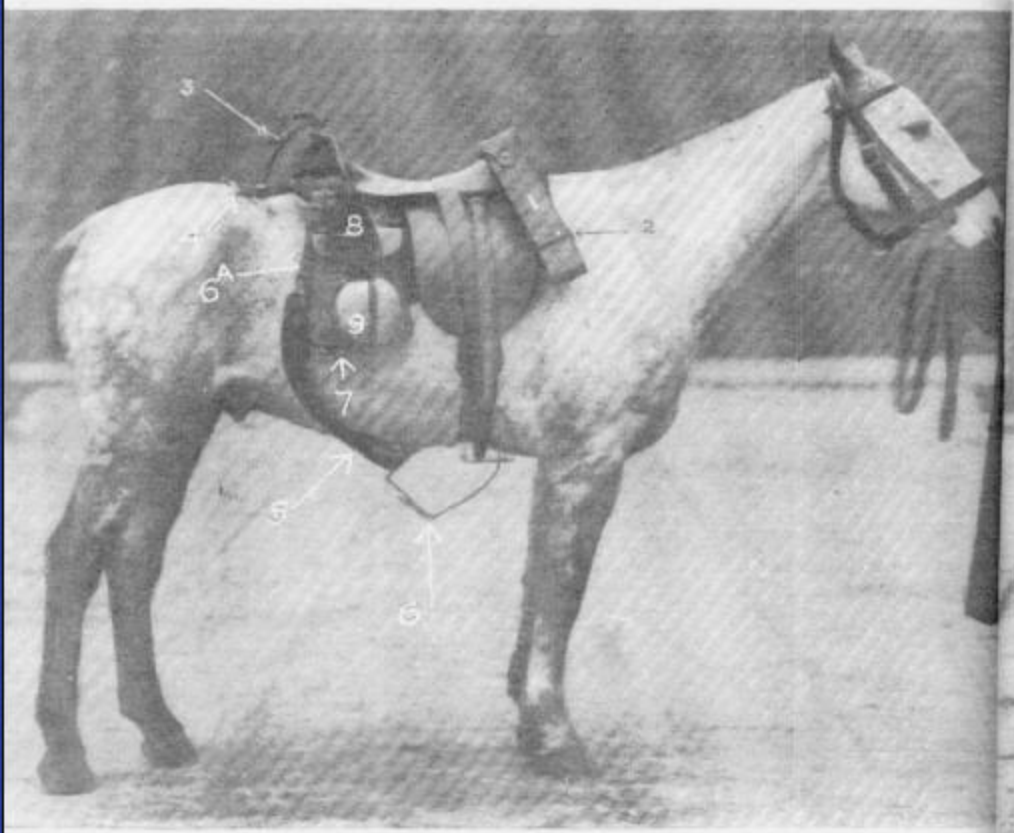
PLATE XVII.



No. 1 Horse—Near Side, with Gun.

1. Ammunition wallets.
2. Guide straps for ammunition wallets.
3. Bucket, gun. Showing the gun in it, with the breech cover fastened.
4. Strap, trunnion attachment affixed below the trunnion.
5. Girth, balancing.
6. Connecting strap of the "girth, balancing."

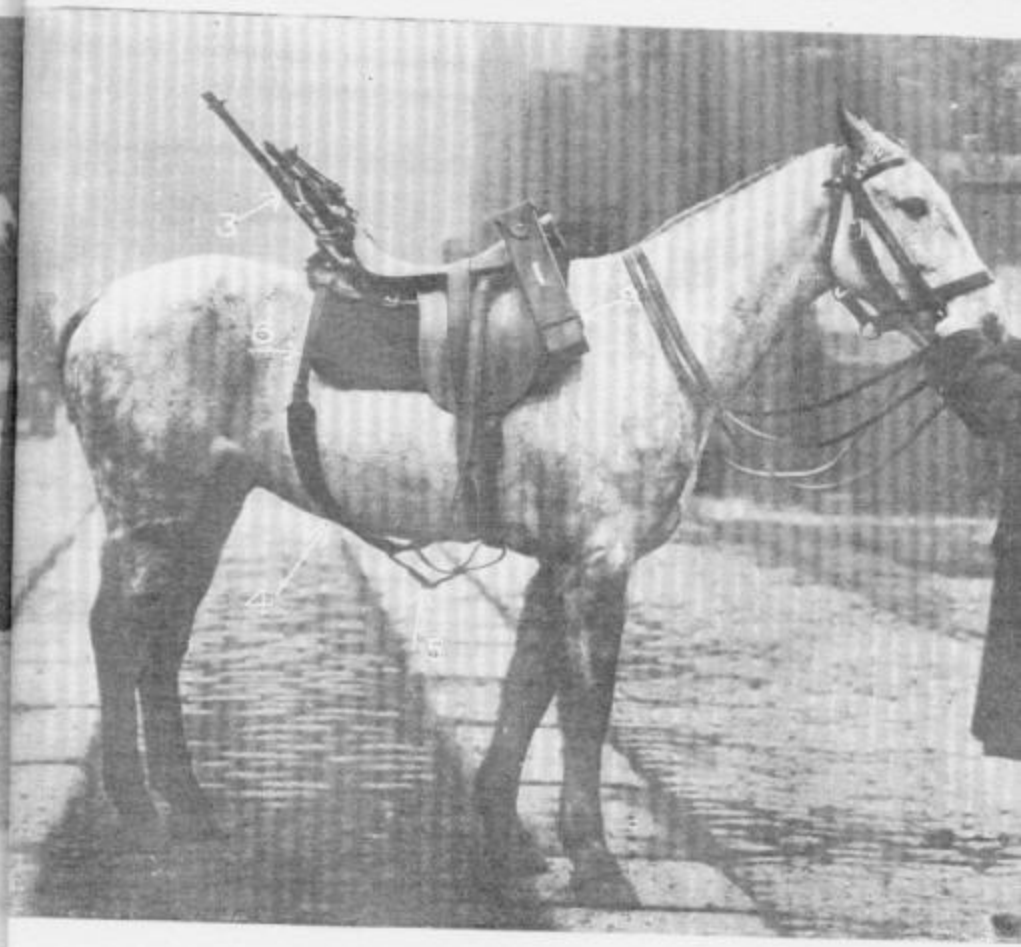
PLATE XVIII.



No 1 Horse—Off Side, without Gun.

1. Ammunition wallets.
2. Guide straps for ammunition wallets.
3. Strap, trunnion attachment (loose).
4. Strap, gas cylinder and hind arch attachment (loose).
5. Girth, balancing.
6. Connecting strap to "girth, balancing."
6A. Attachment strap to "girth, balancing."
7. Bag, saddle.
8. Horse brush.
9. Mess tin.

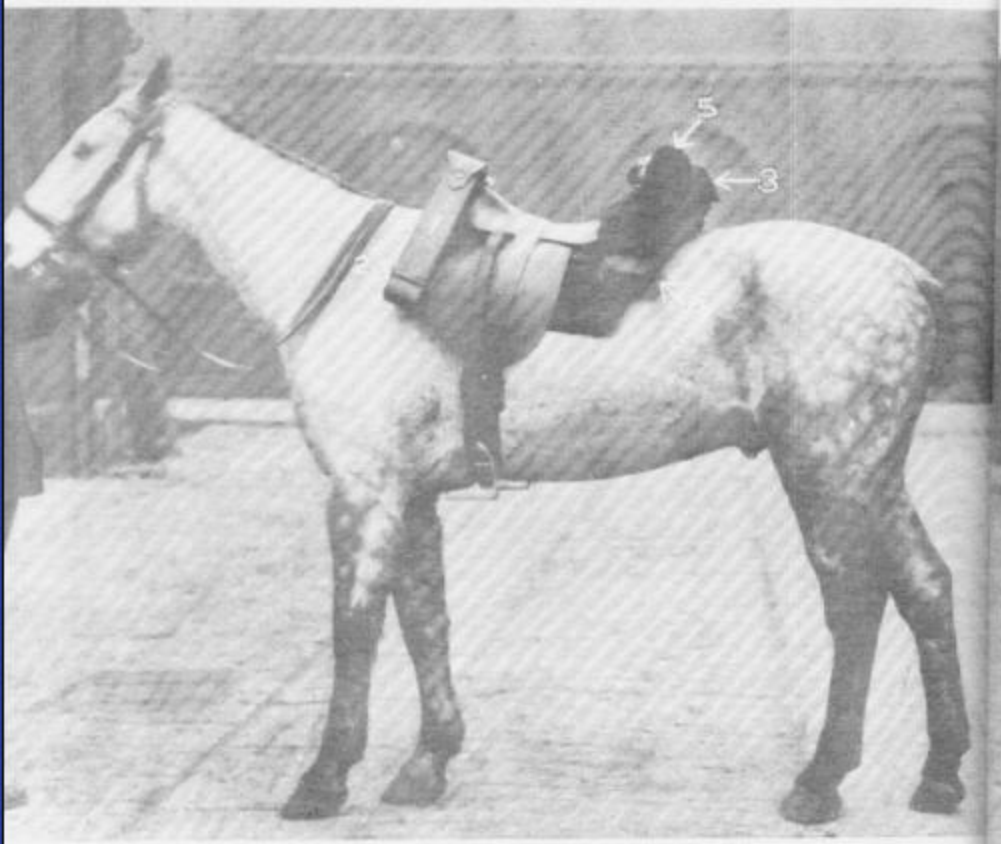
PLATE XIX.



No. 1 Horse—Off Side, with Gun.

1. Ammunition wallets.
2. Guide straps to ammunition wallets.
3. Gas cylinder and hind arch attachment strap fastened to the stay joining the barrel and gas cylinder.
4. Girth, balancing.
5. Connecting strap to "girth, balancing."
6. Attachment strap to "girth, balancing."

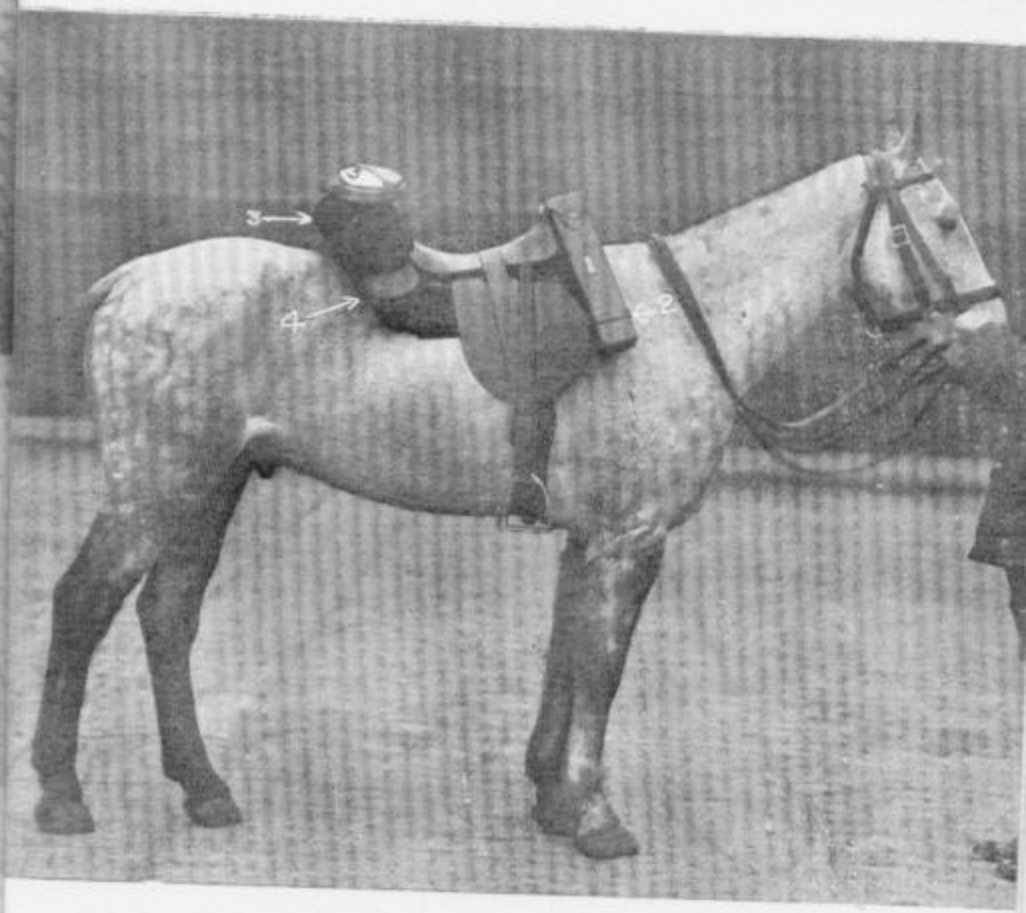
PLATE XX.



NOS. 2 OR 3 HORSE—NEAR SIDE.

1. Ammunition wallets.
2. Guide straps to ammunition wallets.
3. Cloak, rolled and placed on top of wallets.
4. Wallets, extended across rear fans of saddle.
5. Horse brush.

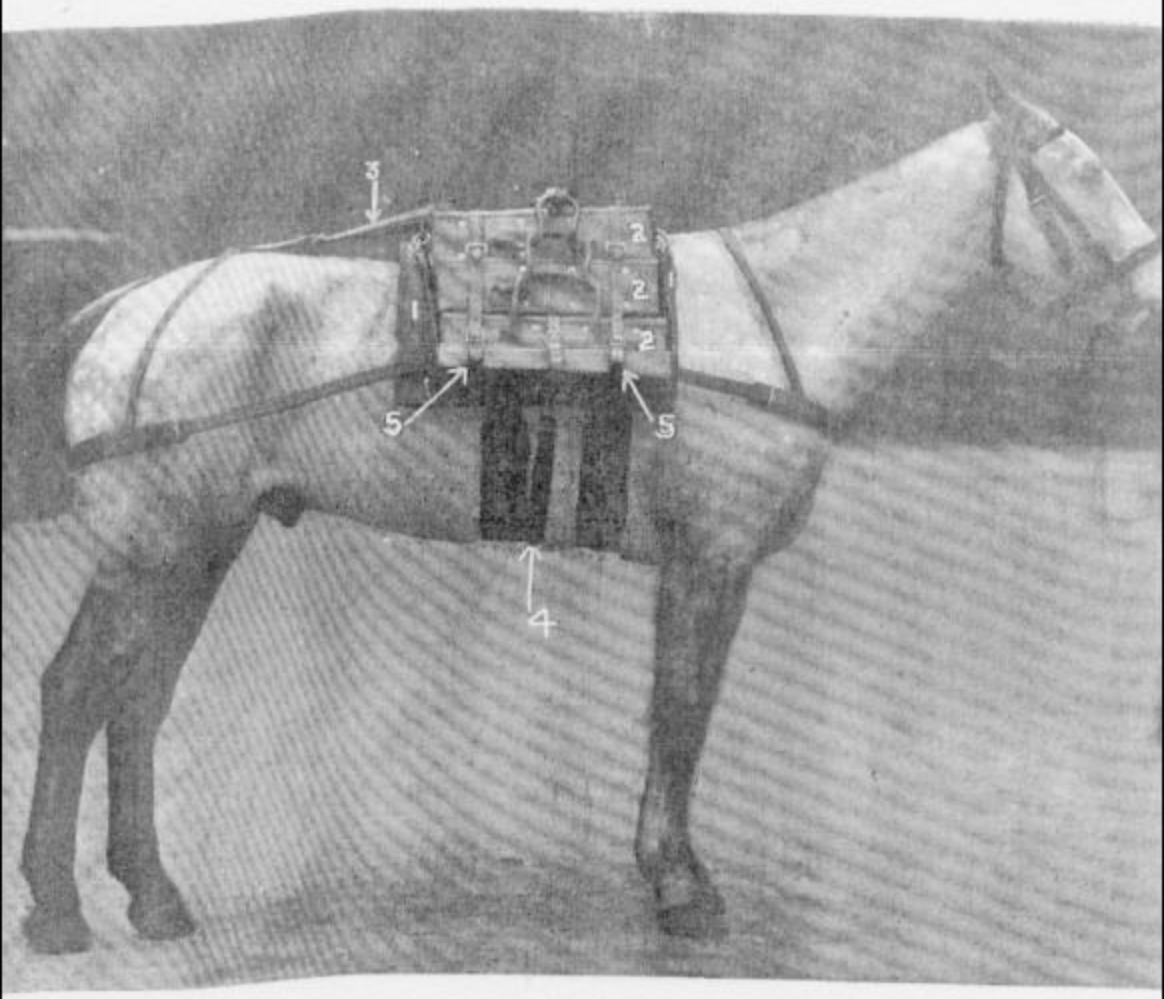
PLATE XXI



NOS. 2 OR 3 HORSES—OFF SIDE.

1. Ammunition wallets.
2. Guide straps to ammunition wallets.
3. Cloak, rolled and placed on top of wallets.
4. Wallets, extended across rear fans of saddle.
5. Mess tin.

PLATE XXII.



AMMUNITION HORSE.

1. Ammunition rack slung to hooks of packsaddle.
2. Ammunition carriers in the ammunition rack with handles interlaced, and the top one secured. Also the method of using the 3-carrier retaining straps.
3. Crupper attached to rear arch of packsaddle.
4. Girth, leather.
5. Straps, retaining, 3-carrier.

PLATE XXIII.